WATER RESOURCES BOARD

Tuesday, August 27, 2019
Operations & Maintenance Facility
1725 South Church Street
3:30 PM

A G E N D A

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1. Consent Agenda:
   A. Consider O&M skid steer purchase 2
   B. Consider WRRF polymer chemical contract renewal 7
   C. Consider JB&S Task Order 19-06 for the Water/Wastewater Mechanical/Electrical Services Contract, RW #5 Rebuild 9

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3. Consider a proposal from ELI for design and bid document preparation for the Joe B Jackson Pkwy gravity sewer and pump station 22

4. Consider SRWTP Pump Asset Management & Optimization Software purchase 25

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7. Consider S&ME Task Order for preparing CCTV inspection bids and project management of HOBAS pipe assessment 44

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9. Consider Sewer Capacity Allocation Ordinance 57

10. Dashboard

11. Other business

12. Adjourn

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MEMORANDUM

DATE: August 15, 2019

TO: Water Resources Board

FROM: Donald Hughes

SUBJECT: O&M – CAT Skid Steer Purchase

BACKGROUND

In MWRD's approved FY 2020 O&M Distribution Capital Budget under *New Equipment – 184840* are line items to purchase a skid steer in the amount of $60,000 and a sweeping broom with dust control in the amount of $15,000 for a total of $75,000. The broom attachment is required to comply with the new OSHA Standards for Silicon Dust Control Regulations.

RECOMMENDATION

Staff recommends the Water Resources Board to recommend the City Council to approve the purchase of a Caterpillar 259D3 Skid Steer with broom and dust control from Thompson Machinery from the state awarded contract.

FISCAL IMPACT

The cost of the reference equipment including broom is $60,289.70 (after trade-in of old machine). The total amount budgeted collectively included in the rate funded capital budget for FY 2020 is $75,000 which is under budget by $14,710.30.

ATTACHMENTS

Thompson Machinery Quote
State of Tennessee Contract #50609

August 7, 2019

MURFREESBORO WATER & SEWER
PO BOX 1477

MURFREESBORO, TENNESSEE 37133-1477

Dear Valued Customer,

We are pleased to present the following quotation for one new 259D3, equipped as follows:

259D3 COMPACT TRACK LOADER
LANE 2 ORDER
CAB PACKAGE, PRO PLUS
HYDRAULICS, PERFORMANCE, (H2)
CONTROL, ISO, PROP, WT
RIDE CONTROL, NONE
BATTERY,HD,DISCONNECT,850 CCA
LIGHTS, HALOGEN
ROPS, ENCLOSED WITH A/C (C3)
DISPLAY, ADVANCED, LCD, CAMERA
FAN, COOLING, DEMAND
QUICK COUPLER, HYDRAULIC
SEAT, SUSPENSION, CLOTH, HEAT
DOOR, CAB, GLASS
RADIO, AM/FM, BLUETOOTH
FILM, TWO SPEED
RUBBER BELT, 2 SPD, TF IDLERS
TRACK,RUBBER,400MM(15.7IN)BLCK
REAR LIGHTS
SEAT BELT, 2"
PRODUCT LINK, CELLULAR PL641
CERTIFICATION ARR, P65
INSTRUCTIONS, ANSI, USA
SERIALIZED TECHNICAL MEDIA KIT
PACK, DOMESTIC TRUCK
SHIPPING/STORAGE PROTECTION
74" GP BUCKET BOCE
BA118C HYDRAULIC ANGLE BROOM
WATER SPRINKLER KIT
MACHINE MOUNTED WATER TANK
WATER TANK INTALL
74" INDUSTRIAL GRAPPLE BUCKET

WARRANTY	
Months:	24
Hours:	2000
Description:	PREMIER
Additional:	Thompson Machinery provides complimentary travel time and mileage for warrantable repairs in the field for the first 6 Months of use.

Purchase Price *(plus applicable taxes):* **$69,789.70 – TN STATE CONTRACT PRICING**

$9,500.00 – CASE SKID STEER LOADER TRADE IN VALUE

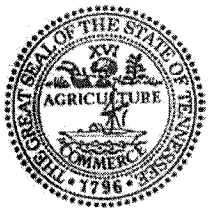
$60,289.70 – PRICE AFTER TRADE IN MACHINE

Thank you for the opportunity to submit this quotation, which will remain valid for 30 days. Should you have any questions, please feel free to contact me. We look forward to earning your business!

Sincerely,

Brandon Cotter

Sales Representative
Thompson Machinery



STATE OF TENNESSEE, DEPARTMENT OF GENERAL SERVICES
CENTRAL PROCUREMENT OFFICE

Statewide Multi-Year Contract Issued to:

Thompson Machinery Commerce Corp.
PO Box 535496
Atlanta, GA 30353-5496

VendoriD:0000001025

Contract Number: 00000000000000000000050609

Title: SWC 219 Highway Maintenance Equipment

Start Date: July 01,2016

End Date: June 30,2020

Is this contract available to local government agencies in addition to State agencies?: Yes

Awarded Regions 2, 3, 4

Purchases by Local Government and Authorized Non-Profit Agencies (SWC)- TSOO

The purpose of this Invitation to Bid is to establish a source or sources of supply for all state agencies, local governmental agencies within the geographic limits of the State of Tennessee, any private nonprofit institution of higher education charter in Tennessee, and any corporation which is exempted from taxation under 26 U.S.C. Section 501(c) (3) as amended and which contracts with the Department of Mental Health and Mental Retardation to provide services to the public (T.C.A. 33-2-401). Purchases by local governmental agencies, private institutions of higher education, and authorized corporations are optional with those agencies, private institutions of higher education, and corporations and offers to sell to local governmental agencies are optional with the bidder.

Contract Contact Information:

State of Tennessee
Department of General Services, Central Procurement Office
Contract Administrator: Mike Neely
3rd Floor, William R Snodgrass, Tennessee Tower
312 Rosa L. Parks Avenue
Nashville, TN 37243-1102
Phone: 615/741-5971
Fax: 615-741-0684

Line Information

Line 1
Item ID:
1000172844 Sweepers Self Propelled, SWC 219 Highway Maintenance Equipment
Unit of Measure: EA
Manufacturer: Laymor
Unit Price:
12% Off Catalog

Line2
Item ID:
1000172845 Pavers Track, SWC 219 Highway Maintenance Equipment
Unit of Measure: EA
Manufacturer: Caterpillar
Unit Price:
29.5% Off Catalog
10% (Screed)

Line3
Item ID:
1000172846 Pavers Rubber Tire, SWC 219 Highway Maintenance Equipment
Unit of Measure: EA
Manufacturer: Caterpillar
Unit Price:
29.5% Off Catalog
10% (Screed)

Line4
Item ID:
1000172847 Rollers Steel Wheel, SWC 219 Highway Maintenance Equipment
Unit of Measure: EA
Manufacturer:
Unit Price:
29% Off Catalog
10% Options

Line 5
Item ID:
1000172849 Excavator Mini, SWC 219 Highway Maintenance Equipment
Unit of Measure: EA
Manufacturer: Caterpillar
Unit Price:
35% Off Catalog
10% Options

Line6
Item ID:
1000172850 Excavator, Compact, SWC 219 Highway Maintenance Equipment
Unit of Measure: EA
Manufacturer: Caterpillar
Unit Price:
33% Off Catalog
10% Options

Line 7
Item ID:
1000172851 Skid Loader Wheel, SWC 219 Highway Maintenance Equipment
Unit of Measure: EA
Manufacturer: Caterpillar
Unit Price:
34.5% Off Catalog
10% Options

Line8
Item ID:
1000172852 Skid Loader Track, SWC 219 Highway Maintenance Equipment
Unit of Measure: EA
Manufacturer: Caterpillar
Unit Price:
34.5% Off Catalog
10%Options

Line 9
Item ID:
1000172853 Mounted Planer, SWC 219 Highway Maintenance Equipment
Unit of Measure: EA
Manufacturer: Caterpillar
Unit Price:
30% Off Catalog
10% Options

Line 10
Item ID:
1000172854 Skid Loader Forestry Mulcher Package, SWC 219 Highway Maintenance Equipment
Unit of Measure: EA
Manufacturer: Caterpillar
Unit Price:
30% Off Catalog
10% Options

APPROVED: Michael F. Perry/AWB Digitally signed by Michael F. Perry/AWB DN: cn=Michael F. Perry/AWB, o=Central Procurement Office, ou, email=Tony.Bybee@tn.gov, c=US Date: 2019.04.24 06:35:18 -05'00' BY: Mike Neely Digitally signed by Mike Neely DN: cn=Mike Neely, o=TN CPO, ou=CPO, email=michael.t.neely@tn.gov, c=US Date: 2019.04.22 12:31:00 -05'00' 4/22/19

CHIEF PROCUREMENT OFFICER — PURCHASING AGENT — DATE

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MEMORANDUM

DATE: August 15th, 2019

TO: Water Resources Board

FROM: John Strickland

SUBJECT: FY20 WRRF Chemical Renewal - Polymer

Background

Invitations to Bid on chemicals for use at the Water Resource Recovery Facility (WRRF) were advertised and released in March of 2015. Bids were publicly opened on March 17th, 2015 in the WRRF Conference Room at 2:00 p.m. CST. Staff reviewed the bid submissions and determined the lowest responsible and responsive bidder.

With the approval of the Board and the Council, Solenis (formerly BASF Inc.) was contracted through FY19 to supply Polymer (Polyelectrolyte Coagulant Dry Polymer – Zetag 8160-931593). The contract included the option for renewal for additional one-year terms.

Recommendation

Staff recommends that the Water Resources Board recommend to City Council approval of a one-year contract extension for the purchase of Polymer from the lowest bidder as referenced below.

Supplier	Chemical	Price/Pound	Estimated Annual Expense
Solenis	Polymer	$1.75	$285,000

Fiscal Impact

The expense for the product is reflected in the 2019-20 Operating Budget. The contract price will be good through May 18, 2020. We now pay the same price/pound as we did in 2007!

Attachment

Contract Extension Letter

City of MURFREESBORO TENNESSEE

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April 1, 2019

Solenis
Attn: Dan Iorio

Re: Polyelectrolyte Coagulant Dry Polymer

Dear Mr. Iorio:

On March 17, 2015 we publicly opened bids for water/wastewater treatment chemicals to use at the Sinking Creek Wastewater Treatment Plant. Section 1.3.4 of the bid documents states **"The successful bidder shall provide the chemical(s) as specified. Pricing shall be effective for the term of the contract, which is through May 18, 2018 with the option to renew for up to two additional one-year terms or one additional two-year term, provided the entire contract term does not exceed five (5) years."** To participate, your prices will have to remain at the bid price with no increase through May 18, 2020. If you do not accept this renewal, the City will need to re-bid your contract. **Your current bid price is $1.75 per pound delivered for Polyelectrolyte Coagulant Dry Polymer.** Zetag 8160 - 931593

Please sign where indicated and return to me as soon as possible if you accept the renewal by the City. If you have any questions please feel free to give me a call at (615) 848-3225

Sincerely,

John Strickland
Superintendent, Water Resource Recovery Facility

Jason Burhans	April 4, 2019
Printed Name	*Date*
	Pricing Analytics and Administration Manager
Signature	*Title*

I accept the offer to extend the contract in accordance with bid documents as stated above.

Water and Sewer Department
300 NW Broad Street * P.O. Box 1477 * Murfreesboro, TN 37133-1477 * Office: 615 890 0862 * Fax: 615 896 4259
TTY 615 848 3214 * www.murfreesborotn.gov

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MEMORANDUM

DATE: August 13, 2019

TO: Water Resources Board

FROM: Alan Cranford

SUBJECT: Water/Wastewater Mechanical/Electrical Services Contract Task Order No. 19-06 Stones River Water Treatment Plant

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Background

Staff submits Task Order No. 19-06 for the Water/Wastewater Mechanical/Electrical Services Contract to remove, rebuild, reinstall and test the #5 raw water pump at the River Raw Water Pump Station. The pump has a leaking seal that is leaking oil and needs repaired to prevent pump damage. Budget pricing includes re-sleeving the impeller, shafts, sleeves, mechanical seal, coupling, spider bushings, brass bearings, pump shaft, bolts, sandblasting and paint (if needed), re-installation, and start-up assistance.

Fiscal Impact

The cost to repair the pump, to include labor and materials, is estimated at $28,000.50. The funding is requested to come from working capital reserves.

Recommendations

Staff recommends the Water Resources Board recommend to the City Council approving JBS Task Order 19-06 in accordance with the JBS estimate.

Attachments

SRWTP - Task Order 19-06 - RW#5 Rebuild – 8-13-19

TASK ORDER NO. 19-06

August 13, 2019

BETWEEN

JOHN BOUCHARD & SONS COMPANY AND CITY OF MURFREESBORO
acting by and through the Murfreesboro Water and Sewer Department

UNDER

Water/Wastewater System Mechanical/Electrical Services Contract

DATED

June 6, 2019 thru June 6, 2020

FOR

RW#5 Pump Repair and Re-Installation

Task Order No. 19-06

RW#5 Pump Work

Murfreesboro Water Plant

BACKGROUND

JBS has been asked to remove, rebuild, and re-install the RW#5 pump under our existing service contract. The pump is currently losing oil at the top of the pump. We have prepared an estimate for the repair/rebuild of the pump for your consideration. Budget pricing includes re-sleeving the impeller, shafts, sleeves, mechanical seal, coupling, spider bushings, brass bearings, pump shaft, bolts, sandblasting and paint (if needed), re-installation, and start-up assistance.

SCOPE OF WORK

Labor and materials by JBS to repair and re-install RW#5 pump as described above, as needed.

FISCAL IMPACT

Murfreesboro Service Contract Rate Sheet - 2019
RW#5 Pump Repairs

Description	Qty (hrs)	Rate	Extended
Project Mgr (RT)	16	$75.00	$1,200.00
Project Mgr (OT)		$110.00	$0.00
Expediter/Delivery (RT)		$29.00	$0.00
Expediter/Delivery (OT)		$43.50	$0.00
Machine Shop Millwright (RT)	240	$60.00	$14,400.00
Machine Shop Millwright (OT)		$90.00	$0.00
HVAC/Plb Service Tech (RT)		$66.00	$0.00
HVAC/Plb Service Tech (OT)		$99.00	$0.00
Air Compressor Tech (RT)		$66.00	$0.00
Air Compressor Tech (OT)		$99.00	$0.00
Laborer - Skilled (RT)	80	$32.00	$2,560.00
Laborer - Skilled (OT)		$48.00	$0.00
Laborer - Unskilled (RT)		$23.00	$0.00
Laborer - Unskilled (OT)		$34.50	$0.00

Equipment	Qty (hrs)	Rate/Hr	Extended
Welder		$15.00	$0.00
Power Threader		$10.00	$0.00
Mini/Midi Hammer		$10.00	$0.00
Variable Reach Forklift		$27.00	$0.00
Pickup Truck	80	$15.00	$1,200.00
Scissor Lift		$19.00	$0.00
Skid Steer		$25.00	$0.00

Materials & Subcontractors		
Hoist		$1,000.00
Parts & Materials		$6,000.00
Misc		$855.00
Markup on Material & Subcontractors	10.00%	$785.50

TOTAL ESTIMATE	$28,000.50

Contractor:	City:
John Bouchard and Sons Company	City of Murfreesboro Water and Sewer Dept.
By: David Proctor IV	By:
Name: David Proctor	Name:
Title: Project Manager	Title:
Date: 8/13/19	Date:

Approved as to Form: _____

Susan Emery McGannon, City Attorney

CONTRACTOR NOTICE CONTACT INFORMATION

John Bouchard and Sons Company

Mailing address 1024 Harrison St.
Nashville, TN 37203

Phone number 615-256-0112

Fax number 615-256-2427

Company Contact David Proctor

E-mail David.Proctor@jbouchard.com

CITY NOTICE CONTACT INFORMATION

Murfreesboro Water and Sewer Dept.

Mailing address 300 NW Broad St.
Murfreesboro, TN 37130

Phone number 615-890-0862

Fax number 615-896-4259

Company Contact Darren Gore

E-mail dgore@murfreesborotn.gov

MINUTES
MURFREESBORO WATER RESOURCES BOARD
July 23, 2019

The Murfreesboro Water Resources Board met on Tuesday, July 23, 2019 in the conference room at the Operations and Maintenance Building, 1725 S. Church Street. Present at the meeting were Board members: Mr. John Sant Amour, Dr. Al Carter, Mr. Ron Crabtree, Ms. Sandra Trail, Ms. Kathy Nobles, Mr. Kirt Wade, and Ms. Madelyn Scales-Harris. Also present were Darren Gore, Valerie Smith, Doug Swann, Michele Pinkston, Anita Heck, Adam Tucker, Steve Tate, Donald Hughes, Alan Cranford, Joe Russell, John Strickland, Mr. Randy McCullough, Mike Bernard, Lynda Sullivan, Ronnie Martin, and Travis Wilson along with other members of the public.

Item G was removed from the Consent Agenda.

Items A through F of the Consent Agenda were presented for the following considerations:

A. Consider sole source purchase of Pit Raider & Nutri Pro odor control products –

In 2013, O&M noticed an increase in the number of odor complaints from the Saratoga Drive area. After investigating the matter, it was found the odor was coming from the Kensington Drive Pump Station which is fed by Tortuga Court Pump Station. The force main between these two pump stations is long and often experiences low velocity. These factors create an odorous and corrosive conditions.

O&M conducted a trial of Pit Raider, a sole source proprietary odor control product, to improve these conditions. It is a bacteria-based hydrogen sulfide treatment combined with a nutrient supplement furnished by State Chemical Products. The trial demonstrated Pit Raider reduced hydrogen sulfide to a minimal level, virtually eliminating the odor and greatly reducing corrosive effects to the manholes. The chemicals were purchased and distributed through the Kensington Pump Station to control ongoing odor issues. Odor complaints greatly diminished, and the Department works closely with a state chemical representative to minimize costs by maintaining optimal feed rates during summer dry and winter wet months.

Staff recommended the Board recommend to City Council to approve the sole source purchase of Pit Raider and Nutri Pro odor control from State Industrial Products.

State Chemical pricing for the Pit Raider and Nutri Pro will remain the same through the FY 2019/2020. The Department has budgeted $50,000 in the operating account.

B. Consider abandonment of sewer easement along Florence Road –

This easement abandonment request is from Shane Hastings, partial owner of the property along Florence Road encumbered with the easement. The family is requesting the abandonment of the existing 20-foot sanitary sewer easement. This easement was recorded in May of 2017 and was intended for a

proposed sewer forcemain easement which was to be installed to serve the new Shelton Square Subdivision. During the design and review stage of the project, Mr. Bob Parks purchased this easement from the Hastings, however, when staff submitted the project to the Tennessee Department of Transportation (TDOT) for review and approval of the sewer forcemain crossing of I-24, TDOT required the design of the forcemain to change and to cross I-24 further to the north. Therefore, this easement is no longer necessary.

Staff recommended that the Board recommend to the Planning Commission and City Council approval of abandoning this existing sewer easement.

C. Consider Ransom Drive P.S. Replacement Final Change Order –

In May 2015, the Board approved the Engineering necessary for the design to replace the existing Ransom Drive Pump Station (PS#9) and forcemain as well as some gravity sewer main replacement. Bids were received on June 13, 2017 for the pump station replacement and brought to the Board at the June 2017 meeting with the recommendation to reject the bids. The project rebid May 10, 2018 and was awarded to SBW Constructors, LLC in the amount of $934,832.

At the January 2019 meeting the Board approved of the use of a portion of the Miscellaneous Allowance through a Work Directive. It was approved to use $5,174 of the $10,000 Allowance amount. The project is now complete and Civil Infrastructure Associates (CIA) has sent a recommendation letter and final balancing change order for approval.

Even with the use of the Miscellaneous Allowance, the contract amount will be reduced by a total of $73,219.75 for a final contract amount of $861,612.25.

Staff recommended that the Board recommend to City Council approval of this final balancing change order.

D. Consider Equipment Operator reclassification –

As a result of a resignation last fiscal year and an accompanying voluntary demotion from an Equipment Operator to a Worker, staff is requesting the Board to allow reinstating the Equipment Operator position for the Operations & Maintenance division.

Darryl Williams was an Equipment Operator working the Jordan and Coleman Farm irrigation operations. He was transferred to O&M in June of 2017, maintaining his position as Equipment Operator working on a vacuum truck.

In July of 2018, Mr. Williams voluntarily requested a demotion to a Worker position which allowed him to drive a dump truck at O&M. In August of 2018, Mr. Williams resigned from the Department.

His original position as Equipment Operator was never replaced and the reclassification from his vacant Worker position to an Equipment Operator was not included as part of the Department's FY20 budget.

Staff recommended to reclassify a Worker job classification to Equipment Operator.

E. Consider Sodium Hypochlorite chemical contract extension –

Invitations to Bid on chemicals for use at the Water Resource Recovery Facility (WRRF) were advertised and released on May 12, 2017. Staff reviewed the bid submissions and determined the lowest responsible and responsive bidder.

With the approval of the Board and the Council, Dycho Company Inc. was contracted through FY19 to supply Sodium Hypochlorite. The contract included the option for renewal for additional one-year terms.

Staff recommended that the Board recommend to City Council approval of a one-year contract extension for the purchase of Sodium Hypochlorite from the lowest bidder, Dycho Company Inc.

Supplier	Chemical	Price/Gallon	Estimated Annual Expense
Dycho Company Inc.	Sodium Hypochlorite	$0.855	$75,000

The expense for the product is reflected in the 2019-20 Operating Budget. The contract price will be good through June 30, 2020.

F. Consider precast manhole structures contract renewal –

On July 12, 2018 bids were opened at O&M to provide precast manhole structures to Murfreesboro Water Resources Department. Two vendors submitted bids and the contract was awarded to the lowest bidder, Foley Products.

The contract with Foley Products expires August 31, 2019. Staff is pleased with the services provided by Foley Products and recommended the Board recommend to City Council to extend the agreement. The contract may be renewed, by mutual written agreement, for two additional two-year periods for a maximum of 5 years at the option of the City. Foley has agreed to extend the contract and the Legal Department is drafting the amendment.

The Operations & Maintenance Department uses an estimated 10 precast manhole structures on sewer projects yearly with an estimated cost of $13,000. All terms and conditions of the contract will remain the same.

A motion was made by Kirt Wade to accept Items A through F of the Consent Agenda as presented and it was seconded by Dr. Carter. The Board voted unanimously to approve.

The May 28, 2019 Board Minutes were unanimously accepted as presented.

The Board considered bids for the 2019 Sanitary Sewer Rehabilitation Contract.

At the December 6, 2018 Board meeting the Board approved the Engineering, Construction Administration & Resident Inspection necessary for this next sanitary sewer rehabilitation project with S&ME.

This project includes 168 linear feet of open cut sewer main replacements, 17,240 linear feet of cured in place pipe (CIPP), lining and/or repairing 136 manholes which is approximately 1335 vertical feet of manhole lining and 170 sewer lateral linings. The design is complete, and bids were received on July 11th.

Two bids were received out of a total of five possible prime contractors. S&ME recommends awarding the project to SBW Constructors, LLC (SBW) in the amount of $3,842,301. They were the lowest responsible and responsive bidder for the project, they also were the contractor on the two previous rehabilitation projects and were very good to work with.

Staff recommended that the Board recommend to the City Council awarding the contract to SBW.

Funding for the Engineering, Construction Administration, Inspection and Construction was approved from a combination of 2018/2019 and 2019/2020 Budget & Working Capital Reserves. The Department has not dipped into these fiscal years for the rehab funding to date. We have been working from the 2017/2018 Budget & Reserves allotments.

Kathy Nobles made a motion to approve. Ron Crabtree seconded. The motion unanimously passed.

The Board considered Walter Hill Dam Change Order No. 1.

Change Order No. 1 for the Walter Hill Dam Maintenance project is necessary to adjust the contract time from 60-day completion to a 347-day completion project, as well as add an additional $75,505.55 to the original contract price of $492,000. The time is necessary due to high flow conditions experienced in the East Fork Stones River (EFSR) last fall, and the additional cost is required due to underwater repair and maintenance work that is outside the original scope of the contract.

Staff offered the following justification and recommendation to approve Change Order No 1:

- **Time** – September through December of 2018 was unseasonably wet and as such created much higher flows in the EFSR that disallowed Haren Construction from completing the dam maintenance project. Haren was issued a stop work order on December 21, 2018. The TN Wildlife Resource Agency and Corps of Engineers permit disallowed any work to occur instream within the river from January 15, 2019 through July 1, 2019 due to the spawning season of certain endangered species in the river. Haren has just remobilized and is starting work on the dam remediation activities and the extension of time is due primarily to the time frame that they were prohibited from working.
- **Cost** – The original scope of work involved lowering the water level behind the dam six feet. Lowering the water level this low renders the raw water pump station upstream of the dam nonoperational due to inability for the pumps to maintain suction. The auxiliary raw water pump station on the lake was intended to solely supply water to the plant when the water level was

lowered; however, due to two Variable Frequency Drive (VFD) failures at the auxiliary raw water pumping station, this station is effectively shut-down until the VFD's are replaced. The time frame for these replacements is 8 weeks. Staff considers this too long and puts us back into the same season as last year that created the higher flows prohibiting the dam remediation from occurring. As a least cost, least risk solution, Haren Construction has proposed to perform the work underwater with divers and not lower the water level behind the dam. This increased cost is $75,505.55. Haren is leveraging an existing relationship to get the divers on the project as soon as possible. There is 2.5% markup on this by Haren for the proposed increase in lieu of the standard 5% markup.

Staff recommended the Board recommend to City Council approval of Change Order No. 1 which adds 287 days to the contract time and adds $75,505.55 to the contract price to the Walter Hill Dam Maintenance Project.

The original bid for the Walter Hill Dam Maintenance contract was $492,000. The additional cost of $75,505.55 is a 15% increase. There is a $15,000 contingency fund in the contract that could absorb some of the added cost, but staff would recommend keeping the contingency fund whole until the project is completed for other potential unforeseen costs. The additional funding is requested to come from the Department's working capital reserves.

Sandra Trail made a motion to approve. Kathy Nobles seconded. The motion unanimously passed.

The Board considered condemnation of sanitary sewer easement on Armstrong Valley Road.

Cornerstone Development, LLC, the developer of Westwind Reserve, requires off-site sanitary sewer easements from three property owners. Two of them have been obtained by agreement. The third owner is willing to grant the easement but has a mortgage with a California lender with MERS as the lender's agent. The developer is concerned about the time that may be required to deal with MERS, and that ultimately the lender may not agree. This third owner does not object to condemnation. The developer will agree to bear all costs of the condemnation and will indemnify the City from any damage claim.

A portion of the sewer improvements that will be installed within these easements for this development are shown on the Departments 201 Wastewater Facilities Plan (Plan) and will serve a larger basin (Basin 97). The design of this sewer and associated costs are not finalized, but staff anticipates the developer to ask for participation in the near future, since staff in following the Plan has asked for a larger/deeper sewer main than necessary for the proposed development.

Staff recommended the Board recommend City Council to approve condemnation, subject to a contract and indemnity agreement with the developer in form approved by the City Attorney.

Sandra Trail made a motion to approve. Ron Crabtree seconded. The motion unanimously passed.

The Board considered testing of Hobas Pipe involving the Southwest Interceptor failure.

In February 2019, a structural failure occurred on the Southwest Interceptor pipeline on the Hutchinson property. The Department expended $314,055 in an emergency contract through Garney Construction to repair the failure and reinstate service through the interceptor. At that time, observers from MWRD, SSR and Garney all indicated that the installation of the pipeline and the backfill surrounding the pipeline were correct per the material specifications and the Contract Documents. There still remains some question as to whether the installed material met the original specifications provided by the material manufacturer, Hobas. In order to verify the mechanical properties of both removed sections of piping as well as those of the materials that were installed under the emergency repair, staff and SSR recommends specimens from both sets of materials be tested.

Staff recommended approval for testing services by Applied Technical Services, Inc. to determine if structural failure of 36" Hobas pipe was due to deficiency in the original piping material.

The cost of testing is quoted at $11,720. An additional $1,000 is budgeted for shipping the pipe to their offices in Marietta, GA. Several materials testing vendors were solicited, and this is the best quote that staff was able to obtain. Funding is requested to come from working capital reserves.

Dr Carter made a motion to approve. Kathy Nobles seconded. The motion unanimously passed.

The Board considered Customer Information System (CIS) software upgrade.

In June 2014 MWRD went live with Advanced Utility Systems (AUS) Customer Information System (CIS) Infinity software, version 3 (V3). The implementation was a culmination of an almost two-year process, beginning with development of an Information Technology (IT) Strategic Plan in the fall of 2012.

Concurrent with the implementation of the CIS software, we launched online access for customers via Infinity.Link and moved from paper to digital with our Service Order system via Infinity.Mobile.

Replacing our legacy CIS software with state-of-the-art off-the-shelf software was the first step in our IT Strategic Plan. Staff followed up the CIS install with Interactive Voice Response (IVR) phone module in early 2015, new financial software (Tyler Munis) in July 2015, and Advance Metering Infrastructure (AMI) in June 2017.

CIS, Link and Mobile have all performed well. They have improved our staff and customer experience.

MWRD has now been using the software for five years. Staff recommends upgrading to the latest version of the CIS and online access software. We will continue to use the Mobile module with the new versions. Version 4 (V4) of CIS and Link offer several enhancements and improvements.

Staff recommended that the Board recommend to City Council approval to upgrade MWRD's CIS software and related online access module.

The total estimated cost for the software update is $343,000. This upgrade was originally budgeted in the FY19 Capital Expenditures at an estimated cost of $300,000. As the purchase was not approved and secured in FY19, funding for this upgrade will come from MWRD Reserves in FY20.

Kirt Wade made a motion to approve. Dr. Carter seconded. The motion unanimously passed.

The Board considered SSR Engineering Work Order 09-47-001.3, Waste Load Allocation Model additional cost.

The original Waste Load Allocation Model that was recommended by the Tennessee Department of Environment and Conservation (TDEC) and was intended to predict impacts of additional Murfreesboro Water Resource Recovery Facility (MWRRF) effluent into the West Fork Stones River (WFSR) has failed. As such, AquAeTer has had to abandon the original WLA Model known as Water Quality Analysis Simulation Program (WASP) and effectively start over using another model known as CE-QUAL-W2.

Starting over has added to the time and expense associated with the original $303,500 task order approved in June of 2017. AquAeTer is requesting an additional $75,000 to complete the WLA model and prepare the final report for TDEC's review.

Staff met with TDEC on June 5, 2017 and they approved the original work plan associated with the Waste Load Allocation. Staff recently met again with TDEC on June 20, 2019 to review the failed results of the WASP model and gain their approval and buy-in to change the WLA model to CE-QUAL-W2.

In June 2013, the Board approved Smith Seckman Reid, Inc. (SSR) and AquAeTer to commence sampling of the East Fork and West Fork Stones River in support of renewing our existing NPDES permit application, introduce the option to TDEC for an additional outfall on the East Fork Stones River, and to demonstrate a favorable trend in biological health of the streams. The Board has approved annual bioassessment sampling since that time and the results have been outstanding.

The WLA model approved in June of 2017 is intended to be the technical foundation that demonstrates the more effluent discharged into WFSR, the more the WFSR is enhanced. The data demonstrates that the biology in the stream is healthy and that the stream is in fact meeting its designated uses.

The failure of the WASP model is an unfortunate setback, but the CE-QUAL-W2 is demonstrating very good prediction for the flow and temperature in the WFSR.

Staff recommended the Board recommend to City Council approval of an additional $75,000 to complete SSR Engineering Work Order 09-47-001.3.

Staff recommended funding coming from the Department's working capital reserves. MWRD's 5-yr CIP earmarked $500,000 for Stones River Water Quality studies and NPDES permitting for FY19. Staff has budgeted an additional $150,000 for FY20 through FY23.

Sandra Trail made a motion to approve. Ron Crabtree seconded. The motion unanimously passed.

Staff gave a presentation on Sanitary Sewer Allocation for Future Land Use.

The last 20-yrs of growth in Murfreesboro has dramatically increased the demands on the wastewater collection system. Regulation of the future allocation of wastewater collection may be necessary for the welfare of the City and its inhabitants.

Federal and state regulations outside the City's purview may restrain the City's ability to obtain additional capacity to support future land use in the City's urban growth boundary. Allocating wastewater treatment and/or sanitary sewer collection capacity may:

- Promote and protect public health and safety
- Enhance the economy by establishing reasonable, orderly, equitable and effective means to allocate wastewater collection capacity
- Assist in uniform and balanced future development to serve the needs of the community and the City's tax digest.

Staff has prepared an analysis to review the Salem Hwy corridor and sanitary sewer service area that was master planned in 1999 and compare it to the current build-out in 2019 to see how much sewer has been allocated, and consequently determine how much sewer capacity is remaining for the areas yet to be developed in this corridor.

Additionally, staff will review the annexed areas by zoning the City has experienced between 2009 and 2019 to determine future land uses that may be applied to sanitary sewer and wastewater allocation.

Under Other Business, the Board considered Murfreesboro Municipal Airport Terminal Change Order No. 2.

Staff previously brought a proposal to the Board to participate in the watermain replacement for the new terminal being constructed at the airport. The Department's participation amount was $56,000 (80% of $70,000), with the City funding the remaining 20%, or $14,000. The scope of the watermain replacement has been expanded increasing the amount to $144,692. The Department's participation amount would therefore increase to $115,753.

Staff recommended the Board recommend to City Council approving Change Order No. 2 as presented.

Ron Crabtree made a motion to approve. Dr. Carter seconded. The motion unanimously passed.

Staff presented and discussed the Water Resources Dashboard Performance for June 2019.

There being no further business, the meeting was adjourned.

_____

John Sant Amour, Chairman

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MEMORANDUM

DATE: August 22, 2019

TO: Water Resources Board

FROM: Valerie H. Smith

SUBJECT: ELI Engineering Proposal
Joe B Jackson Parkway
Gravity Sewer & Pump Station Design

BACKGROUND

The City currently has a Master Services Agreement (MSA) with ELI, LLC approved February 2018. The Department has utilized the MSA for various small projects to assist Engineering such as the revisions of our standard water/sewer/repurified water specifications and details, develop a draft set of step system specifications and to develop a Sewer Master Plan for the Joe B Jackson area between I-24 and the Middle Fork of the Stones River.

The Master Plan is developed in two phases, and staff is ready to move forward issuing a Work Authorization for Phase I to design and prepare bid documents only. Staff will hold off having ELI send the design out for bids until such time that development in this area is eminent or the City moves forward with locating a Solid Waste Transfer Station in this area.

RECOMMENDATION

Staff recommends that the Board recommend to the City Council approval of the Work Authorization with ELI, through the MSA.

FISCAL IMPACT

Funding for this design was not funded through the Operating Budget so it is requested to come from Working Capital Reserves in an amount not to exceed $39,000.

ATTACHMENTS

ELI Proposal
Exhibit

ENERGY LAND & INFRASTRUCTURE

ENGINEERS • SURVEYORS • INFRASTRUCTURE • ENVIRONMENTAL

August 19, 2019

Valerie Smith, PE
MWRD Assistant Director - Engineering
220 NW Broad Street
Murfreesboro TN, 37133

Re: Joe B. Jackson Sewer Phase 1

Dear Ms. Smith,

Energy Land & Infrastructure, LLC (ELI-LLC) is pleased to offer the following proposal for professional services as needed by the Murfreesboro Water Resources Department (MWRD) for the design of the Joe B Jackson Sanitary Sewer Project Phase 1. ELI-LLC proposes to provide professional engineering services as outlined in the attached Standard Form of Agreement Between Owner and Engineer.

ELI-LLC proposed to conduct these professional services at an hourly rate not to exceed **$39,000.00**. Work shall be completed within 180 days of the execution of this Agreement.

We appreciate the opportunity to provide professional services to the Murfreesboro Water Resource Department for this project. If you agree to its terms, please sign and return a copy of the Agreement.

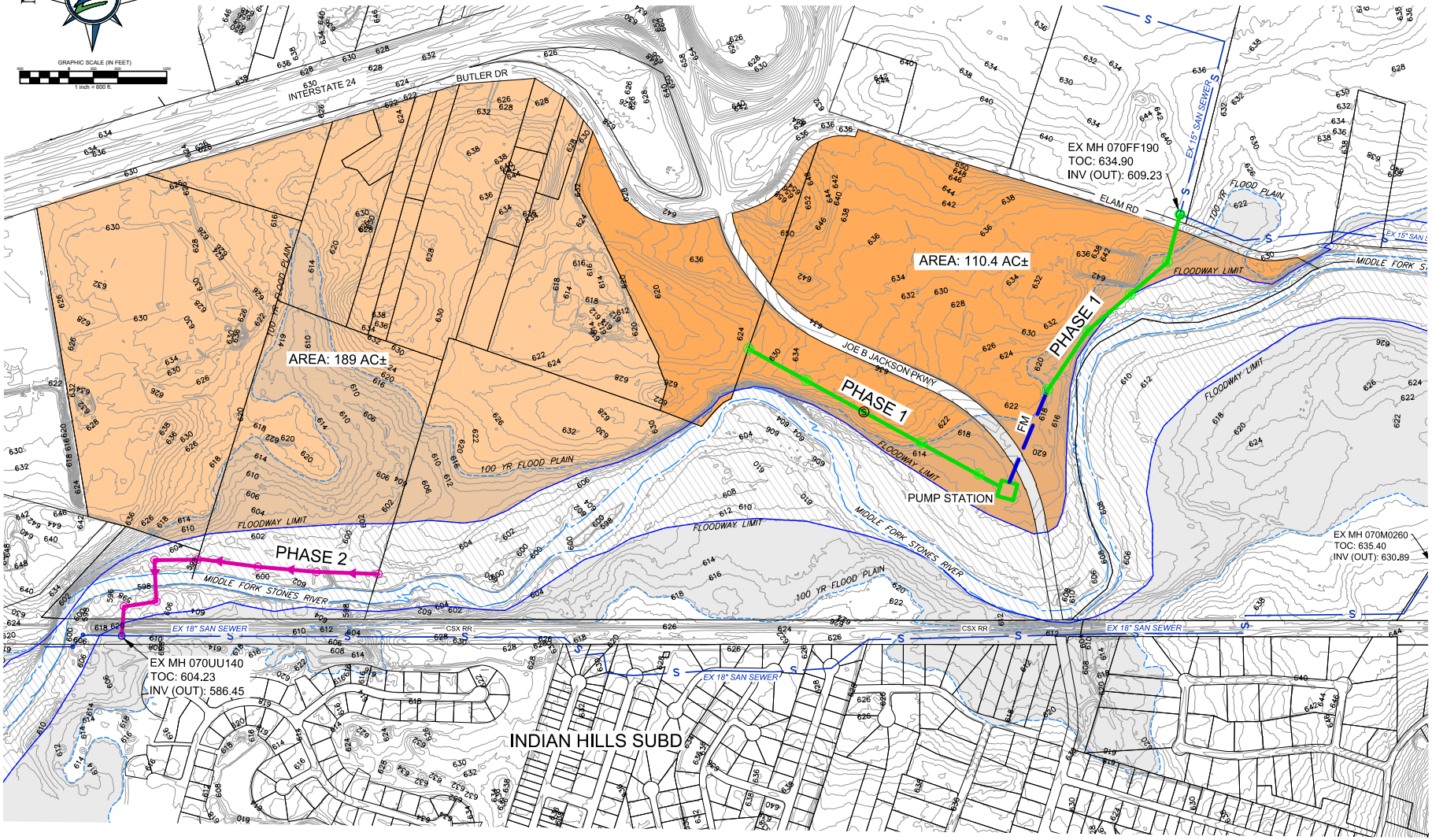
Warmest regards,

ENERGY LAND & INFRASTRUCTURE, LLC

Jay W. Bradley

Jay W. Bradley, PE

Attachments



ENERGY LAND & INFRASTRUCTURE
745 S CHURCH ST, SUITE 805 • MURFREESBORO, TN 37130
OFFICE 615-933-6300 • WWW.ELI-LLC.COM
ENGINEERS • SURVEYORS • INFRASTRUCTURE • ENVIRONMENTAL

EXHIBIT I
JOE B JACKSON SEWER
MURFREESBORO WATER RESOURCES DEPT
RUTHERFORD COUNTY, TENNESSEE

Rev.	Date	Revision Description

Issue Date:	8.20.19
ELI Project No:	19.12.1401
Drafted By:	DKH
Checked By:	JWB

Sheet Title:
EXHIBIT I
JOE B JACKSON
SEWER
PH 1 & 2
WITH
PUMP STA

Sheet No.
1

Filename: R:\19-12-1401 MWRD MSA #4 #2 JBJ Sewer Study\3_CAD\Production\Exhibits\JBJ SEWER EXHIBIT PS.dwg
Layout Name: Layout1
Plotted: Thursday, August 22, 2019 - 10:43 am
By: DKH

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MEMORANDUM

DATE: August 15, 2019

TO: Water Resources Board

FROM: Alan Cranford

SUBJECT: Specific Energy Pump Asset Management and Optimization Software
Stones River Water Treatment Plant

Background

Currently standard procedure for plant operators to operate raw and finished water pumps, is to simply turn on the pump that provides the flow needed for water demand. Operators do not have the tools to determine if a pump is operating on its pump curve or if the pump is operating efficiently. A pump operating off of curve will cause pump cavitation and eventually destroy the pump. Pump cavitation is when air bubbles, instead of water, occupy the space inside the impellor. When the air bubbles implode it erodes the impeller surface causing damage to the pump.

Additionally, operators have no scientific way of knowing if a pump impellor is becoming severely worn until the pump begins to fail. For a little over 18-months staff and SSR have been researching different artificial intelligence programs that are designed to identify worn pumps and make repair recommendations based on financial metrics instead of replacing pumps far beyond their useful life or even after complete failure. This will reduce lifecycle costs and prevent unplanned outages with predictive asset management. It also allows operators to maximize efficiency by selecting the optimal combination of pumps and speeds to maintain level or pressure with a variety of constraints. The pumps can run within their preferred operating ranges (POR) to minimize energy consumption without causing cavitation or other damaging effects. The one program that stood out among three other manufacturers is Specific Energy.

Staff requested a quote from the Specific Energy, the sole-source manufacturer of the Specific Energy Pump Asset Management and Optimization software. Purchasing has reviewed the sole source request and documentation and agrees this is a sole source purchase.

Fiscal Impact

The cost for purchasing the Pump Asset Management and Optimization Software for the Auxiliary Pump Station is $14,300 and River Pump Station is $15,140. Funding will come from the FY20 Capital Budget. Annual Costs for Annual Service fees for the Auxiliary Pump Station

is $6,800 and River Pump Station is $4,640. This amount will be budgeted in the Annual Operating Budget.

Recommendation

Staff recommends that the Board recommend to the City Council purchasing the Pump Asset Management and Optimization software in accordance with their quote.

Attachments

Specific Energy Sole Source Letter
Auxiliary Pump Station Quote
River Pump Station Quote

SPECIFIC ENERGY

1978 S. Austin Ave. Georgetown, TX 78626 | (512) 930-9415 | specificenergy.com

August 15, 2019

Sole Source Letter

This letter is to provide notification that Specific Energy, Inc. is the sole source provider of Pump Asset Management and Optimization technology for measuring and tracking pump capacity and efficiency over time, tracking pump operation in real-time, and operating pump stations at minimum specific energy (kWh/MG). There is no other product or service available that can perform equivalent functions to Specific Energy's Asset Management and Optimization Suites.

Specific Energy pioneered the concept of measuring and controlling pumps based on kilowatt-hours (kWh) consumed per million gallons (MG) pumped, a quantity known as specific energy. Specific Energy's suites continually calculate specific energy and flow for all combinations of pumps and speeds to ensure that pump stations operate as efficiently as possible at all times while meeting operating constraints. Specific Energy is the only tool capable of producing live in-situ pump curves and continually tracking where pumps are operating on these curves.

As a result of our investment in innovation, we have created a portfolio of intellectual property rights that include:

- Patented Technology
- Trade Secrets

We are the only organization in the world with the unique technical expertise, experience, and proprietary technology to bring the best practices in pump station asset management and optimization to City of Murfreesboro's water and wastewater pumping systems.

Perry C. Steger
President, Specific Energy, Inc.

SPECIFIC ENERGY
1978 S. Austin Avenue • Georgetown, Texas 78626 • 512-930-9415

Alan Cranford
Plant Manager
P.O. Box 1477
Murfreesboro, TN
615-848-3222
acranford@murfreesborotn.gov

February 27, 2019

Proposal for Pump Asset Management and Optimization

Project Description

Pump Asset Management and Optimization for:

Murfreesboro Water Resources Department
Auxiliary Pump Station
4837 Central Valley Road
Murfreesboro, TN

Description	Power (hp)		Notes
Pump 1	400	hp	Fairbanks-Morse w/ VFDs
Pump 2	400	hp	Fairbanks-Morse w/ VFDs
Pump 3	400	hp	Fairbanks-Morse w/ VFDs

Overview of Services

Specific Energy proposes to furnish a Dynamic Pump Optimizer (DPO) configured for the above-named pump station. The DPO implements Specific Energy's asset management and optimization technologies.

Specific Energy's DPO enables routine operator-initiated pump testing for comparison of current pump condition to ideal factory pump curves. The DPO calculates Pump Health Index (PHI), continually recalculates annualized excess energy costs due to worn pumps, and recommends pumps for repair or replacement based on a rigorous financial analysis. This financial analysis can be incorporated into a comprehensive pump asset management program to determine optimal scheduling of pump repairs.

Additionally, the DPO calculates the combination of pumps and speeds that satisfies current flow demand while maximizing energy efficiency. The DPO selects the most efficient combination of pumps and speeds that operates each pump within its Preferred Operating Range. As system conditions change throughout the day, the DPO recomputes the solution to ensure the station continues to operate at minimum specific energy (kWh/MG).

The DPO may be used in either Advisory Mode (operators use recommendations from the DPO to select which pumps and speeds to use) or DPO-Mode (pump station PLC uses recommendations from the DPO to continually operate the pump station at peak performance).

Detailed Scope of Services

Configuration and Installation Support Phase

The Configuration and Installation Support Fee is a one-time fee that includes the following services **provided by Specific Energy:**

Standard Services

- Configure Specific Energy equipment to match customer's specific application, including configuration of communications and modeling of station piping, pumps, and sensors.
- Deliver Specific Energy DIN-rail mountable hardware for field installation by others, including wiring instructions to connect the equipment to power and electrical equipment and controllers.
- Customized programming and written instructions to configure customer's equipment to communicate with the Specific Energy DPO.
- Unlimited support by Specific Energy's technical staff for the installation phase during normal business hours (Monday through Friday, 8 AM to 5 PM CT), including commissioning and initial troubleshooting. During this phase, the cellular or direct internet connection must be active so Specific Energy's staff can remotely monitor and troubleshoot the equipment.

The following items are not included in Specific Energy's Scope of Services, and are to be provided by others:

- Install Specific Energy DIN-rail mountable DPO inside existing pump station control panel (requires 12 VDC or 120 VAC from an uninterruptible power supply).
- Install instrumentation required by DPO: tank level or suction pressure, discharge pressure, pump station flow, and per pump powers, run statuses, and speeds.
- Configure pump station PLC to communicate with DPO.

Operational Phase

The Dynamic Pump Optimizer Annual Service Fee includes these services **by Specific Energy**:

- DPO and cellular modem replacement upon failure
- Unlimited Cellular data plan
- Secure 24-hour operator interface with no license restrictions for number of concurrent users
- Data logging at one-second resolution.
- Telephone and email technical support during normal business hours (Monday through Friday, 8 AM to 5 PM CT)
- Automatic updates for ongoing software enhancement, bug fixes, and security patches
- Monthly Pump Station Reports including individual pump report cards, delivered via email.

Estimate of Savings for Murfreesboro Water Resources Department Auxiliary Pump Station

The table below estimates expected cost reductions for this pump station. Energy reduction estimates are based on annual energy consumption for this pump station (either reported or estimated based on pump station size) of $200,000 and average savings percentage reported by existing DPO installations.

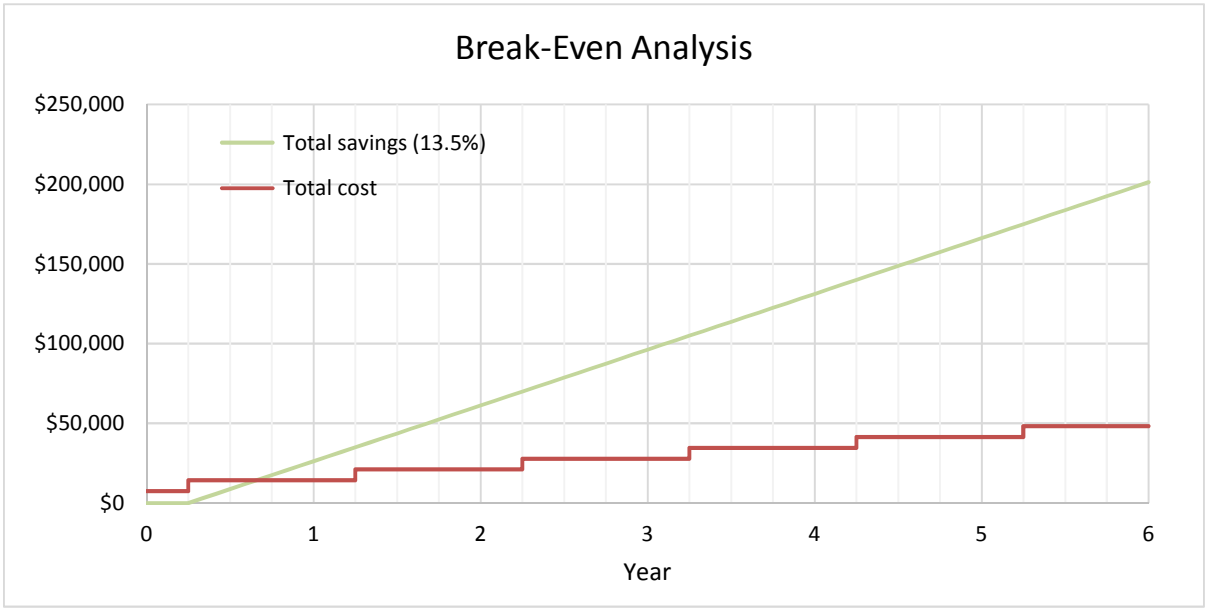
The estimates of reduction in repair costs assume pump life is extended from 10 years to 15 years and that repairs cost $200 per horsepower.

Estimated Annual Savings			**$**	**35,000**
13.5% Energy Reduction (50% of typical due to fixed speed pumps)	$	27,000		
Reduced Repair Costs	$	8,000		

Break-even Analysis

One-time Costs			**$**	**7,500**
Configuration and Installation Support Fee (CISF)	$	7,500		
Annual return			**$**	**28,200**
Estimated Annual Savings	$	35,000		
Annual Service Fee	$	(6,800)		
Break-even point (13.5% energy reduction)				**0 yrs, 8 mos**

The chart below shows cumulative costs and savings as a function of time. It is based on the one-time costs and annual costs shown above. It assumes that commissioning of the DPO is completed and optimization is turned on three months after initial delivery and billing.



Quotation

One-Time Configuration and Installation Support Fee (CISF)			$	
Base fee ($4,500/station)	$	4,500		
CISF Pump Configuration Fee ($1,000/pump)	$	3,000		
Total One-Time Configuration and Installation Support Fee (CISF)			**$**	**7,500**
Annual Base Service Fee			$	
Base Fee, includes Specific Energy client interface, unlimited simultaneous users, one-second data logging, historical trending, exporting, alarm and event logging and reporting	$	3,200		
Power fee, Pumps up to 2000 hp ($3/hp * 1200 hp)	$	3,600		
Power fee, Pumps > 2000 hp ($1.5/hp * 0 hp)	$	-		
Total Annual Service Fees			**$**	**6,800**
Proposal Total			**$**	**14,300**

Summary

I am pleased to prepare this proposal for your consideration. This proposal is valid for 180 days from the date of this proposal.

Respectfully submitted,

Michael Blake

Signature

By signature below, I hereby agree to abide by the terms and conditions specified herein.

MURFREESBORO WATER RESOURCES DEPARTMENT

By: _____ Date: _____

Signature of Authorized Signer

_____

Printed Name & Title of Authorized Signer

SPECIFIC ENERGY

1978 S. Austin Avenue • Georgetown, Texas 78626 • 512-930-9415

Alan Cranford
Plant Manager
P.O. Box 1477
Murfreesboro, TN
615-848-3222
acranford@murfreesborotn.gov

February 27, 2019

Proposal for Pump Asset Management and Optimization

Project Description

Pump Asset Management and Optimization for:

Murfreesboro Water Resources Department
Sam Jared Pump Station
5528 Sam Jared Drive
Murfreesboro, TN 37129

Description	Power (hp)		Notes
Pump 1	100	hp	Fairbanks Morse Vertical Turbine Single-stage 100
Pump 2	100	hp	Fairbanks Morse Vertical Turbine Single-stage 100
Pump 3	100	hp	Fairbanks Morse Vertical Turbine Single-stage 100
Pump 4	60	hp	
Pump 5	60	hp	
Pump 6	60	hp	

Overview of Services

Specific Energy proposes to furnish a Dynamic Pump Optimizer (DPO) configured for the above-named pump station. The DPO implements Specific Energy's asset management and optimization technologies.

Specific Energy's DPO enables routine operator-initiated pump testing for comparison of current pump condition to ideal factory pump curves. The DPO calculates Pump Health Index (PHI), continually recalculates annualized excess energy costs due to worn pumps, and recommends pumps for repair or replacement based on a rigorous financial analysis. This financial analysis can be incorporated into a comprehensive pump asset management program to determine optimal scheduling of pump repairs.

Additionally, the DPO calculates the combination of pumps and speeds that satisfies current flow demand while maximizing energy efficiency. The DPO selects the most efficient combination of pumps and speeds that operates each pump within its Preferred Operating Range. As system conditions change throughout the day, the DPO recomputes the solution to ensure the station continues to operate at minimum specific energy (kWh/MG).

The DPO may be used in either Advisory Mode (operators use recommendations from the DPO to select which pumps and speeds to use) or DPO-Mode (pump station PLC uses recommendations from the DPO to continually operate the pump station at peak performance).

Detailed Scope of Services

Configuration and Installation Support Phase

The Configuration and Installation Support Fee is a one-time fee that includes the following services **provided by Specific Energy:**

Standard Services

- Configure Specific Energy equipment to match customer's specific application, including configuration of communications and modeling of station piping, pumps, and sensors.
- Deliver Specific Energy DIN-rail mountable hardware for field installation by others, including wiring instructions to connect the equipment to power and electrical equipment and controllers.
- Customized programming and written instructions to configure customer's equipment to communicate with the Specific Energy DPO.
- Unlimited support by Specific Energy's technical staff for the installation phase during normal business hours (Monday through Friday, 8 AM to 5 PM CT), including commissioning and initial troubleshooting. During this phase, the cellular or direct internet connection must be active so Specific Energy's staff can remotely monitor and troubleshoot the equipment.

The following items are not included in Specific Energy's Scope of Services, and are to be provided by others:

- Install Specific Energy DIN-rail mountable DPO inside existing pump station control panel (requires 12 VDC or 120 VAC from an uninterruptible power supply).
- Install instrumentation required by DPO: tank level or suction pressure, discharge pressure, pump station flow, and per pump powers, run statuses, and speeds.
- Configure pump station PLC to communicate with DPO.

Operational Phase

The Dynamic Pump Optimizer Annual Service Fee includes these services **by Specific Energy**:

- DPO and cellular modem replacement upon failure
- Unlimited Cellular data plan
- Secure 24-hour operator interface with no license restrictions for number of concurrent users
- Data logging at one-second resolution.
- Telephone and email technical support during normal business hours (Monday through Friday, 8 AM to 5 PM CT)
- Automatic updates for ongoing software enhancement, bug fixes, and security patches
- Monthly Pump Station Reports including individual pump report cards, delivered via email.

Estimate of Savings for Murfreesboro Water Resources Department Sam Jared Pump Station

The table below estimates expected cost reductions for this pump station. Energy reduction estimates are based on annual energy consumption for this pump station (either reported or estimated based on pump station size) of $200,000 and average savings percentage reported by existing DPO installations.

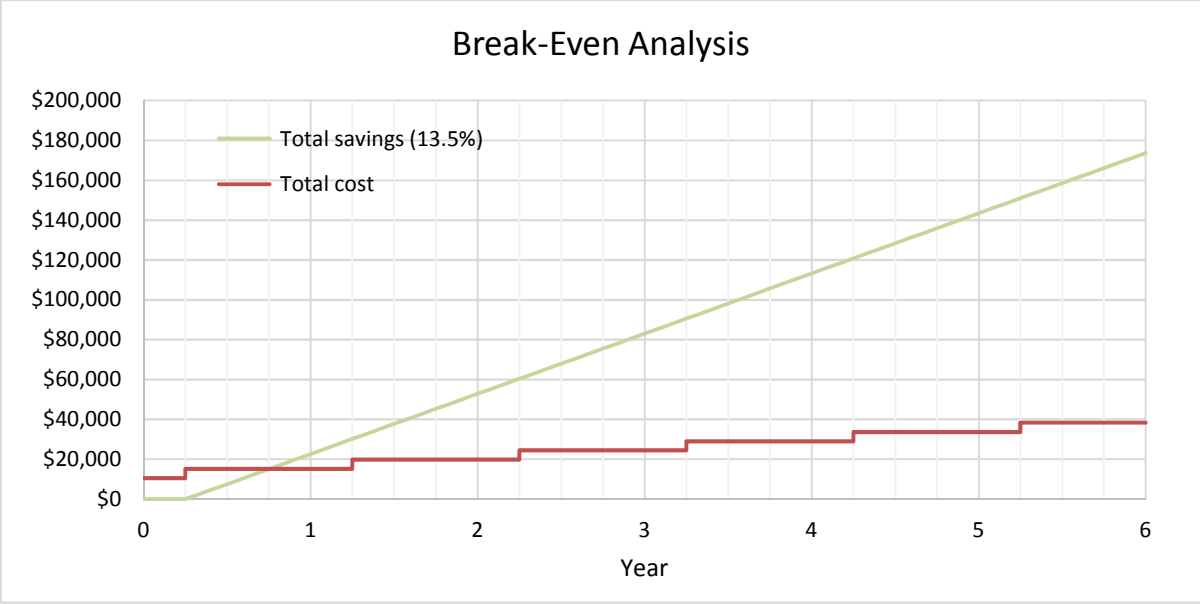
The estimates of reduction in repair costs assume pump life is extended from 10 years to 15 years and that repairs cost $200 per horsepower.

Estimated Annual Savings			**$ 30,200**
13.5% Energy Reduction (50% of typical due to fixed speed pumps)	$	27,000	
Reduced Repair Costs	$	3,200	

Break-even Analysis

One-time Costs			**$ 10,500**
Configuration and Installation Support Fee (CISF)	$	10,500	
Annual return			**$ 25,560**
Estimated Annual Savings	$	30,200	
Annual Service Fee	$	(4,640)	
Break-even point (13.5% energy reduction)			**0 yrs, 10 mos**

The chart below shows cumulative costs and savings as a function of time. It is based on the one-time costs and annual costs shown above. It assumes that commissioning of the DPO is completed and optimization is turned on three months after initial delivery and billing.



Quotation

One-Time Configuration and Installation Support Fee (CISF)				
Base fee ($4,500/station)	$	4,500		
CISF Pump Configuration Fee ($1,000/pump)	$	6,000		
Total One-Time Configuration and Installation Support Fee (CISF)			**$**	**10,500**
Annual Base Service Fee				
Base Fee, includes Specific Energy client interface, unlimited simultaneous users, one-second data logging, historical trending, exporting, alarm and event logging and reporting	$	3,200		
Power fee, Pumps up to 2000 hp ($3/hp * 480 hp)	$	1,440		
Power fee, Pumps > 2000 hp ($1.5/hp * 0 hp)	$	-		
Total Annual Service Fees			**$**	**4,640**
Proposal Total			**$**	**15,140**

Summary

I am pleased to prepare this proposal for your consideration. This proposal is valid for 180 days from the date of this proposal.

Respectfully submitted,

Michael Blake

Signature

By signature below, I hereby agree to abide by the terms and conditions specified herein.

MURFREESBORO WATER RESOURCES DEPARTMENT

By: _____ Date: _____

Signature of Authorized Signer

_____

Printed Name & Title of Authorized Signer

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MEMORANDUM

DATE: August 23, 2019

TO: Water Resources Board

FROM: Randy McCullough

SUBJECT: O&M – Collector & Tower System Install at Stoney Meadow Tank (Sole Source Purchase)

BACKGROUND

In 2015, MWRD launched a meter replacement program, known as Advanced Meter Infrastructure (AMI). All water meters were replaced with meters utilizing radio frequency technology. This new technology improves efficiency by enabling meter reading information to be captured automatically.

The cellular collector unit (CCU) installed atop of the Stoney Meadow Tank is experiencing intermittent failures. We are requesting the purchase of a tower collector unit (TCU) to replace the CCU. This upgrade will provide several significant benefits including easier and safer access to the unit as it will be installed at the base of the tower instead of the top, it will extend the reading distance of the collector, and guarded against lightning strikes and other weather events.

RECOMMENDATIONS

Staff would like to request the sole source purchase of the tower system and one collector in the amount of $26,000.00 from United Systems. Staff recommends the Board recommend to City Council approval to purchase the tower system and one collector.

FISCAL IMPACT

Funding for the purchase of the Itron Repeaters and Collector was approved in MWRD's FY20 Rate Funded Capital Budget for a total of $16,000 for the TCU (collector) and $10,000 for the installation of the tower system, for a total of $26,000.

ATTACHMENTS

Itron Repeater Quote, Sole Source Letter

United Systems

Local Office 1443 Union Camp Road | Lafayette, TN 37083
Corporate P.O. Box 547 | 205 Ash Street | Benton, KY 42025
Phone 615.388.4877 | Toll-free 1.800.455.3293 | FAX 270. 527.3132
www.united-systems.com

United Systems & Software, Inc. is a technical services firm that specializes in the software development and information technology to utilities and local government. Founded in 1977, USS now serves over 400 customers within eight-state region. As a distributor of Itron Automatic Meter Reading (AMR) and metering technology, we offer complete AMR systems, radio transmitters & receivers, handheld & mobile computers, software, installation, training and support.

Itron

February 22, 2019

Quotation For:
Murfreesboro Water Resources Department

Will Taylor
Tennessee Territory Manager

Qty	Product/Service Description	Unit Price	Extended Price
1	CCU-7127-032 Tower CCU 100, AC, Verizon, WAN Tower Based TCU	$16,000.00	$16,000.00
1	TCU Install	$10,000.00	$10,000.00
Total-			**$26,000.00**

Post Warranty Services- As an Itron Business Partner, USS will provide local support and consultation for this Itron meter reading system. At any time during the life of the system, USS will provide supplemental fee-based services upon the client's request. Itron will be handling the day-to-day support responsibility for the Itron software and hardware, with all calls being routed to Itron Customer Care Specialists in the Global Services Center. From the Center, Itron can deliver support across all meter reading products and systems from a single location, resulting in speedier and more efficient resolution to a wide range of customer needs. The Center maintains hours of 8:00 EST to 5:00 PST (or 8:00 EST), with Customer Care Specialists on-call 24-hours per day for emergencies.

Agreement Addendum— Client acknowledges this Agreement Addendum has been read and understood, and agrees to be bound by its terms. Client further agrees that this is a complete and exclusive statement of Agreement between the parties, which supersedes all implied, oral, and written communications between the parties relating to this Agreement. This Agreement Addendum shall be effective when signed by both parties. This Agreement Addendum is entered into as of this ___ day of _____, 201__. This is an Addendum to Original Agreement on file.

United Systems & Software, Inc.

By / Title: _____

Murfreesboro Water Resources Department

By / Title: _____

United Systems

Itron
Authorized Direct Distributor

February 5, 2019

Randy McCullough
AMI/Field Service Manager
Murfreesboro Water Resources Department

VENDOR RELATIONSHIP

Founded in 1977, United Systems has worked in the utility industry from the outset and this experience provides an invaluable perspective on your needs. This understanding, coupled with the skills of our multi-disciplined technical staff, enable us to provide AMR & AMI solutions and services that address your operation's distinct requirements. Since 1999, United Systems has offered EMR, AMR & AMI solutions. Currently, we serve more than 500 clients across a nine state region.

As an Itron Distributor, United Systems provides local support and consultation for Itron AMI / AMR systems. At any time during the life of the system, United Systems will service your system, with supplemental support from Itron's service group.

Once the system is on-line, Itron typically handles the day-to-day support responsibility for the Itron software and hardware, with all calls being routed to Itron Customer Care Specialists in the Global Services Center. From the Center, Itron can deliver support across all meter reading products and systems from a single location, resulting in speedier and more efficient resolution to a wide range of customer needs. The Center maintains hours of 8:00 EST to 5:00 PST (or 8:00 EST), with Customer Care Specialists on-call 24-hours per day for emergencies.

Unlike many suppliers, United Systems' in-house experts brings some unique advantages to system delivery and installation. Most suppliers are distribution houses that represent a myriad of products with AMR & AMI systems being one of many product lines. Conversely, United Systems is completely vested in technology and specializes in the delivery & on-going support of AMR & AMI solutions. Our project management skills include CIS/Billing software interface services, software & hardware installation, user training, field training, testing & troubleshooting, meter & radio endpoint installation and life-cycle system support.

United Systems' is fully certified by Itron in the delivery of technical services and project management for the Itron Choice Connect AMI hardware solutions. Our team of experts is one of very few AMR/AMI organizations in the nation to reach this distinction with four (4) in-house technicians available to deliver expertise & assistance throughout the AMI system implementation.

United Systems is the sole distributor of Itron water & gas products in the State of Tennessee.

We look forward to serving your needs during this project!

Sincerely,

Brian R. Boyd, Vice President
United Systems & Software, Inc.

Corporate: P.O. Box 547 | 205 Ash Street | Benton, KY 42025
Local Office: 94 Arlis Gene Circle, Lafayette, TN 37083
Phone: 270.527.3293 | 800.455.3293 | FAX: 270.527.3132 | www.united-systems.com

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MEMORANDUM

DATE: August 21, 2019

TO: Water Resources Board

FROM: Valerie H. Smith

SUBJECT: Westwind Reserve Subdivision
Armstrong Valley Road
Sewer Extension Participation

Background

At last month's Board meeting, staff brought an easement condemnation request for approval for the Lesieur property along Armstrong Valley Road. This approval was to allow the City's assistant in a "friendly condemnation" of an off-site sewer easement needed for a sewer main extension to the above development. In that meeting it was mentioned that staff would bring back to the Board, at a later meeting, a sewer participation request to install a larger and deeper sewer main extension as per the 201 Wastewater Facilities Plan (201 Plan). The 201 Plan shows an 18" sewer interceptor extension and the development only needed an 8" sewer main to serve the project.

SEC has prepared and submitted a request letter and sewer cost estimate to determine the participation amount and it is attached.

A few points per the Department's participation policy, within our approved Policies, Procedures & General Design Requirements adopted in 2009 by the Board & Council are:

1. Prior to dedication and acceptance of the improvements by the City, the Developer requesting reimbursement must present to the City Council a detailed statement of the actual eligible costs and the City Council in its discretion may amend the agreement, and the reimbursement amount, to reflect the actual project costs.
2. Should a project be eligible for participation by the City due to upsizing of a water or sewer line, the Department reserves the right to publicly bid the project or the portion of the project eligible for participation.
3. Participation in the cost to upsize water and/or sewer lines shall be in accordance with established policies in effect. The Department or Developer can prepare a schedule of upsize participation, based on recent bid results or agreed upon unit pricing, which the Department and the Developer may accept in lieu of publicly bidding, subject to approval of the Water and Sewer Board and City Council.

4. The Department will only participate on that portion of sewer deeper than twelve (12) feet deep, if the sewer is upsized and if the material changes.
5. Sewer must extend to the limits of construction at strategic locations for future extension.

Recommendation

Staff recommends the Board recommend to City Council approval of the sewer participation for a larger and deeper sewer interceptor.

Fiscal Impact

It is requested that participation in the amount of $108,631.05 come from the Department's working capital reserves. There are adequate reserves to fund this amount.

Attachments

Engineers Request & Estimate
GIS Exhibit

SEC, Inc.

SITE ENGINEERING CONSULTANTS
Engineering • Surveying • Land Planning
850 Middle Tennessee Blvd, Murfreesboro, TN 37129
www.sec-civil.com • 615-890-7901 • fax 615-895-2567

August 19, 2019

Valerie Smith
Murfreesboro Water Resource Department
300 NW Broad St.
Murfreesboro, TN 37129

RE: Westwind Reserve
SEC Project No. 07094

Dear Valerie:

Cornerstone Development, LLC is requesting that Murfreesboro Water Resource Department participate in the cost of construction for Sanitary Sewer Line A for the proposed Westwind Reserve Subdivision.

The attached drawing depicts the approximate layout of the sewer. The proposed Sewer Line A includes seven new manholes and approximately 2,118 linear feet of sewer main that is 14'-20' in depth. SEC evaluated the proposed main line extension under two different conditions. The first condition shows the main line extension along Armstrong Valley Road as an 8" PVC @ 0.4% Slope which would have needed to be installed to serve just the Westwind Reserve Subdivision and the second condition shows the mainline extension as a 18" PVC @ 0.12% slope to the design depth to serve the proposed Westwind Reserve Subdivision and any future properties to the south.

SEC's Opinion of Probable Cost of these improvements for Line A are as follows:

8" SDR 26 @ 0.4% slope to a depth of 12'	***- $270,453.98***
18" SDR 26 @ 0.12% slope	***- $379,085.02***
Difference	***- $108,631.05***

It should be noted that SEC, Inc. has no control over the cost of labor, materials, equipment or services furnished by others or over the Contractor(s)' method of determining prices or over competitive bidding or market conditions. SEC, Inc.'s Opinions of Probable Cost are made on the basis of our experience and qualifications and represent our best judgment as an experienced and qualified professional engineering firm, familiar with the construction industry. SEC, Inc. cannot and does not guarantee that proposals, bids or actual project costs will not vary from Opinions of Probable Cost prepared by SEC, Inc.

If you should have any questions concerning this submittal, please feel free to call me at (615) 890-7901 or email me at jmoody@sec-civil.com.

Sincerely,

Jeremy Moody, E.I.
SEC Inc.

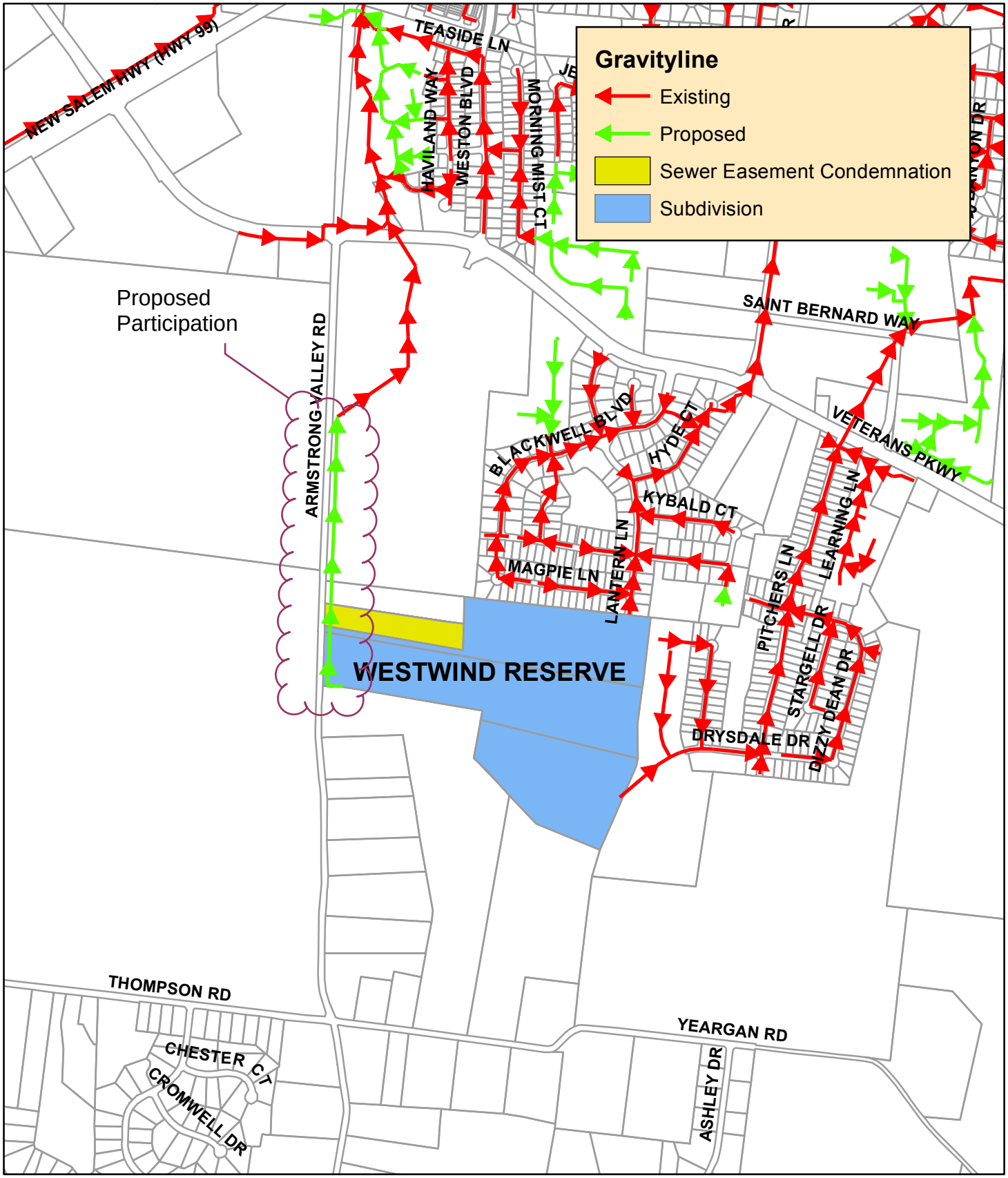
ENGINEER'S OPINION OF CONSTRUCTION COST
Westwind Reserve Offsite Sewer
8/22/2019

Line A Sanitary Sewer Construction Cost - 8" SDR 26 @ 0.4% Slope					
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	8" DIP - 14'-16' Deep	LF	220	$ 125.00	$ 27,500.00
2	8" PVC-SDR 26 - 12'-14' Deep	LF	698	$ 90.00	$ 62,779.50
3	8" PVC-SDR 26 - 14'-16' Deep	LF	1200	$ 100.00	$ 120,000.00
4	Manhole - 12'-14' Deep	EA	2	$ 2,500.00	$ 5,000.00
5	Manhole - 14'-16' Deep	EA	5	$ 3,000.00	$ 15,000.00
6	Tie into Existing Manhole	EA	1	$ 3,000.00	$ 3,000.00
7	Air Testing Lines	LF	2118	$ 1.00	$ 2,117.55
8	Vacuum Test Manholes	EA	8	$ 250.00	$ 2,000.00
9	Inspection Fee (W&S Dept.)	LF	2118	$ 1.50	$ 3,176.33
10	CCTV Inspection Fee (Estimate)	LF	2118	$ 2.50	$ 5,293.88
				Sub-Total:	**$ 245,867.25**
				10% Contingencies:	**$ 24,586.73**
				Sewer Total:	**$ 270,453.98**

Line A Sanitary Sewer Construction Cost - 18" SDR 26 @ 0.12% Slope					
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	18" DIP - 14'-16' Deep	LF	220	$ 180.00	$ 39,632.40
2	18" PVC-SDR 26 - 14'-16' Deep	LF	784	$ 130.00	$ 101,966.80
3	18" PVC-SDR 26 - 16'-18' Deep	LF	1113	$ 140.00	$ 155,846.60
4	Manhole - 16'-18' Deep	EA	3	$ 4,000.00	$ 12,000.00
5	Manhole - 18'-20' Deep	EA	4	$ 4,500.00	$ 18,000.00
6	Tie into Existing Manhole	EA	1	$ 3,000.00	$ 3,000.00
7	Air Testing Lines	LF	2118	$ 1.25	$ 2,647.16
8	Vacuum Test Manholes	EA	8	$ 250.00	$ 2,000.00
9	Inspection Fee (W&S Dept.)	LF	2118	$ 1.50	$ 3,176.60
10	CCTV Inspection Fee (Estimate)	LF	2118	$ 3.00	$ 6,353.19
				Sub-Total:	**$ 344,622.75**
				10% Contingencies:	**$ 34,462.27**
				Sewer Total:	**$ 379,085.02**

Sanitary Sewer Construction Cost - 8" @ 0.4% Slope:	$ 270,453.98
Sanitary Sewer Construction Cost - 18" @ 0.12% Slope:	$ 379,085.02
Difference In Cost:	**$ (108,631.05)**

Note: SEC, Inc. has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' method of determining prices, or over competitive bidding or market conditions. SEC, Inc.'s opinions of Probable Cost are made on the basis of our experience and qualifications and represent our best judgement as an experienced and qualified professional engineering firm, familiar with the construction industry. SEC, Inc. cannot and does not guarantee that proposals, bids or actual project costs will not vary from Opinions of Probable Cost prepared by SEC, Inc. If prior to the Bidding or Negotiating Phase the owner wishes greater assurance as to Project Costs, the owner shall employ an independent cost estimator.



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MURFREESBORO WATER AND SEWER DEPARTMENT

LESIEUR SEWER EASEMENT CONDEMNATION

City of MURFREESBORO TENNESSEE

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MEMORANDUM

DATE: August 21, 2019

TO: Water Resources Board

FROM: Valerie H. Smith

SUBJECT: Sewer Interceptor Inspection
S&ME Engineering Task Order #20190819
Hobas Pipe > 15 FT Deep

BACKGROUND

As you are aware, the Department is currently working to repair our second pipe failure along the Southwest Interceptor Sewer. It was originally thought that this second failure was along a portion of the interceptor that was ductile iron pipe, however, after future investigation both failures have been in sections that used Hobas pipe. The other common factor with these failures, are the depth, their location in relation to the river and ground water.

This being our second failure with Hobas pipe, staff is worried that additional sections of our Hobas Interceptor lines could be failing, now that we have had 2 within 8 months of each other. Through our Master Services Agreement (MSA) with S&ME, Inc. we have asked for three different Tasks. Task 1 is for their assistance to put together specifications, maps and bid documents to bid out televising all of our Hobas pipe within the system that is 15 feet in depth or greater. We have 30,652 feet of Hobas pipe in the system and 24,220 feet of this is greater than 15 feet in depth. This is a larger job, and more precise type of closed-circuit televising (CCTV) than the Department is capable of doing in-house. S&ME is specifying several different technologies so that the CCTV company will be able to provide an accurate enough survey, that if we decide to televise again in a year or two, that we could make some educated determinations on as to whether the pipe is still in good shape, beginning to fail or failing to the point that it needs replacement or rehabilitation.

Task 2 is for overall project management. To include CCTV inspection management, evaluation of the deliverables from the contractor, updates during the work, process pay applications and providing a summary of findings or defects to staff that will merge with our GIS mapping system.

Task 3 is on an as needed basis and as directed by the Department for emergency assistance if the CCTV reveals another failure is eminent.

RECOMMENDATION

Staff recommends that the Board recommend to the City Council approval of the Engineering Task Order with S&ME, through our Master Services Agreement, for Sewer Interceptor Inspection, including project management, quality assurance monitoring and GIS integration.

Staff also requests preapproval for awarding the bid to the lowest responsive and responsible contractor for the actual CCTV inspection work in the event the bid amount does not exceed $475,000. In the event that the Board preapproves this amount, staff will notify the Board of the results and take the bids to City Council for formal contract approval.

FISCAL IMPACT

Funding for this work is in an amount not to exceed $50,500. This work was not budgeted and is unforeseen, so funding is requested to come from the Department's working capital reserves.

The subsequent work associated with bidding the CCTV inspection work anticipated not to exceed $475,000 and also requested to be funded from working capital reserves.

ATTACHMENTS

S&ME Task Order #20190819
GIS Exhibit

TASK ORDER NO. 20190819

To the AGREEMENT BETWEEN OWNER AND ENGINEER FOR PROFESSIONAL SERVICES

For HOBAS PIPE INSPECTION & EVALUATION PROJECT

This Task Order made and entered into by and between **MURFREESBORO WATER RESOURCE DEPARTMENT**, hereinafter called the "OWNER" and **S&ME, INC.**, hereinafter called the "ENGINEER," shall be incorporated into and become a part of the Agreement Between Owner and Engineer for Professional Services entered into by the parties hereto on the 28th of August 2012, (the "AGREEMENT").

PURPOSE

This Task Order authorizes and directs the ENGINEER to proceed in providing to the OWNER professional engineering services for assisting OWNER in the inspection and evaluation of HOBAS pipe within the collection system as specified.

ENGINEER'S SCOPE OF SERVICES

The Scope of Services, dated August 19, 2019, is enumerated in Exhibit A. It is entitled "HOBAS Pipe Inspection and Evaluation Project" and consists of 2 pages.

COMPENSATION

As consideration for providing the services enumerated within Exhibit A of this Task Order, the OWNER shall compensate the ENGINEER in accordance with the AGREEMENT. The specific method and/or amount of compensation for this Task Order is enumerated in the attached Exhibit C.

TASK ORDER NO. 20190819

Exhibit A

Date: **August 19, 2019**

Owner: **Murfreesboro Water Resource Department**

Project Title **HOBAS Pipe Inspection & Evaluation Project**

Project Location **Murfreesboro, TN**

SCOPE OF SERVICES

Task 1 – Development of Specifications & Bidding Services

ENGINEER will develop specifications to be used in the inspection and evaluation of the HOBAS pipe specified by OWNER. Specifications will be based on the National Association of Sewer Service Companies (NASSCO) to determine the current condition of the pipe inspected. The specifications will outline and include the requirements of the current NASSCO standards. ENGINEER will coordinate with OWNER in assembling front-end contract documents and associated forms. ENGINEER will coordinate with OWNER to develop bid items and assemble an estimate of cost for the project. ENGINEER will coordinate with OWNER regarding special or unique circumstances that may need to be considered during the project.

ENGINEER will create a map book in PDF format from the current GIS layer to depict those segments to be inspected and include pertinent information such as pipe diameter, street name, etc. Maps will include aerial background layers to assist in identifying surroundings.

ENGINEER will assist in advertising the project to prospective bidders via email and phone calls to ensure adequate participation in the project. ENGINEER will facilitate getting bid packets distributed to prospective bidders as requested and will respond to RFIs during the bid process. ENGINEER will review and evaluate each submitted bid and provide a recommendation to OWNER. ENGINEER will facilitate conforming of bid documents.

Task 2 – CCTV Inspection Management, Evaluation, and Summary of Findings

Upon award of the bid, ENGINEER will conduct a kickoff meeting with contractor and OWNER to discuss the project and provide additional pertinent information. ENGINEER will conduct up to three (3) site visits during the inspection work to conduct a QA/QC of the data collected. One (1) of the site visits will be conducted at the commencement of work.

During the course of work, ENGINEER will receive a preliminary cut of data from contractor to perform QA/QC review and provide feedback as needed. ENGINEER will provide OWNER updates as needed during the course of work. ENGINEER will review and evaluate pay applications as submitted by contractor and forward approved pay application to OWNER to facilitate final approval.

Upon completion of work, ENGINEER will receive the final database, videos, and photos. ENGINEER will review the final deliverables to ensure quality. ENGINEER will integrate CCTV videos and database information into existing GIS map with point defects identified and provide OWNER with an inspection layer. ENGINEER will provide a summary of findings to OWNER.

Task 3 – Emergency Assistance

It is likely that with the recent failures of the HOBAS pipe, some additional coordination outside the scope of Tasks 1 & 2 may be necessary such as additional pipe analysis, coordination with CIPP contractors, and coordination with MWRD staff to facilitate decisions for future action. This phase will be authorized as requested and needed by MWRD staff.

Schedule

Upon execution of the agreement, ENGINEER will begin work as outlined in the above Task Order. It is understood that OWNER would like to facilitate the inspection process based on the urgency of current pipe conditions.

TASK ORDER NO. 20190819

Exhibit B

OWNER'S RESPONSIBILITIES

OWNER shall provide ENGINEER with any pertinent documentation from OWNER's legal department relating to bidding of sanitary sewer collection system projects and provide assistance, direction, and comments regarding the OWNER's purchasing procedures. OWNER shall make available any necessary staff to provide pertinent information in the development of project specifics.

TASK ORDER NO. 20190819

Exhibit C

COMPENSATION

The ENGINEER will be compensated for the Scope of Services as follows:

The fee for **Task 1 – Development of Specifications & Bidding Services** will be billed a lump sum amount of $12,750.

The fee for **Task 2 – CCTV Inspection Management, Evaluation, and Summary of Findings** will be billed on an hourly basis at standard rates with a not-to-exceed maximum of $34,250. All expenses incurred as part of completing this task will be billed at a rate at cost plus ten percent (10%). Expenses may include but are not limited to project mileage, postage, printing, lodging, sustenance, etc.

The fee for **Task 3 – Emergency Assistance** will be billed on an hourly basis at standard rates with a not-to-exceed maximum of $3,500. All expenses incurred as part of completing this task will be billed at a rate at cost plus ten percent (10%). Expenses may include but are not limited to project mileage, postage, printing, lodging, sustenance, etc.

The ENGINEER will bill monthly, based on the percentage of work completed each month. Unpaid invoices after 30 days will accrue service charges at 1 1/2% per month and include any costs of collections and reasonable attorney's fees.

IN WITNESS WHEREOF, the parties hereto have executed **Task Order No. – 20190819** as a part of the "Agreement between Owner and Engineer for Professional Services-Task Order Edition" on this, the 19th day of August 2019.

S&ME, INC.

By: Travis E. Wilson

Printed: Travis E. Wilson

Title: Principal Project Manager

CITY OF MURFREESBORO

MURFREESBORO WATER RESOURCE DEPARTMENT

By: _____

Printed: Mayor Shane McFarland

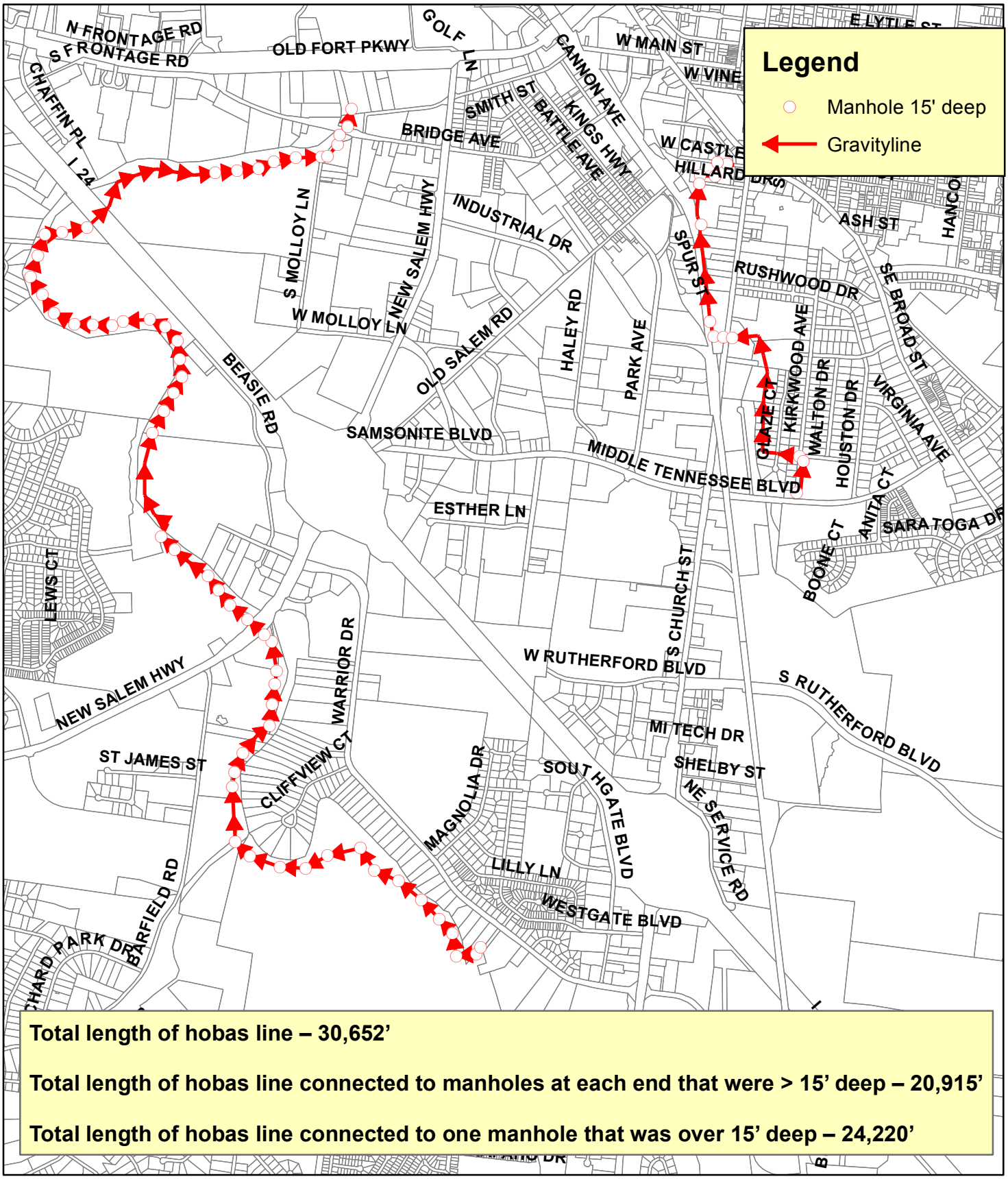
Title: Mayor

APPROVED AS TO FORM:

By: _____

Printed: Adam Tucker

Title: City Attorney



Total length of hobas line – 30,652’

Total length of hobas line connected to manholes at each end that were > 15’ deep – 20,915’

Total length of hobas line connected to one manhole that was over 15’ deep – 24,220’

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MURFREESBORO WATER AND SEWER DEPARTMENT

Hobas Fiberglass Gravitylines

City of MURFREESBORO TENNESSEE

KMC HOBAS.MXD
8/23/2019

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MEMORANDUM

DATE: August 22, 2019

TO: Water Resources Board

FROM: Darren Gore

SUBJECT: Cost Reimbursement by General Fund to Water and Sewer Enterprise Fund for Use of Soccer Fields on Jordan Farm

---

Summary

Accept $917,000 from the City's General Fund for the 26.2 acres utilized by the Parks and Recreation Department for soccer fields on the Jordan Farm.

Background Information

It was recently mentioned that the City general fund had never reimbursed the City water resources enterprise fund for the land being used as soccer fields on the Jordan Farm and it was time to reconcile the area utilized and associated land purchase price to appropriately refund the water resources enterprise fund.

The City used water resource funds to buy the 200-acre Jordan Farm in 2003 for $6,000,000 ($30,000 per acre). The soccer fields (6 of them) were constructed in 2016 and they take up approximately 26.2 acres of the Jordan Farm (see attached survey exhibit). Staff had initially presented to the Board in June 2015 that the City was more interested in forming a lease agreement whereby the City general fund would make an annual payment to the enterprise fund at an estimated amount of $18,000 per year.

After researching this refunding mechanism, the City has acknowledged some requirements on grant money obtained by the Parks and Recreation Department that require these soccer fields to be permanent and not temporary. As such staff believes it better for the City general fund to make the appropriate one-time payment compensating for the 26.2 acres being used as soccer fields.

I would recommend the City general fund reimburse the water/sewer enterprise fund $917,000. This equates to $35,000 per acre for the 26.2-acre area being used as soccer fields.

Time value of money places the cumulative price change at around 39% between 2003 and 2019. That equates the cost per acre to approximately $42,000. I believe a fair compromise is $35,000 per acre given the improvements that were made in installing an irrigation system on the 26.2 acres, and what was formerly an area on the farm that we were prohibited from land applying effluent is now capable of being irrigated. This helps divert effluent from being discharged to the river which in turn allows for

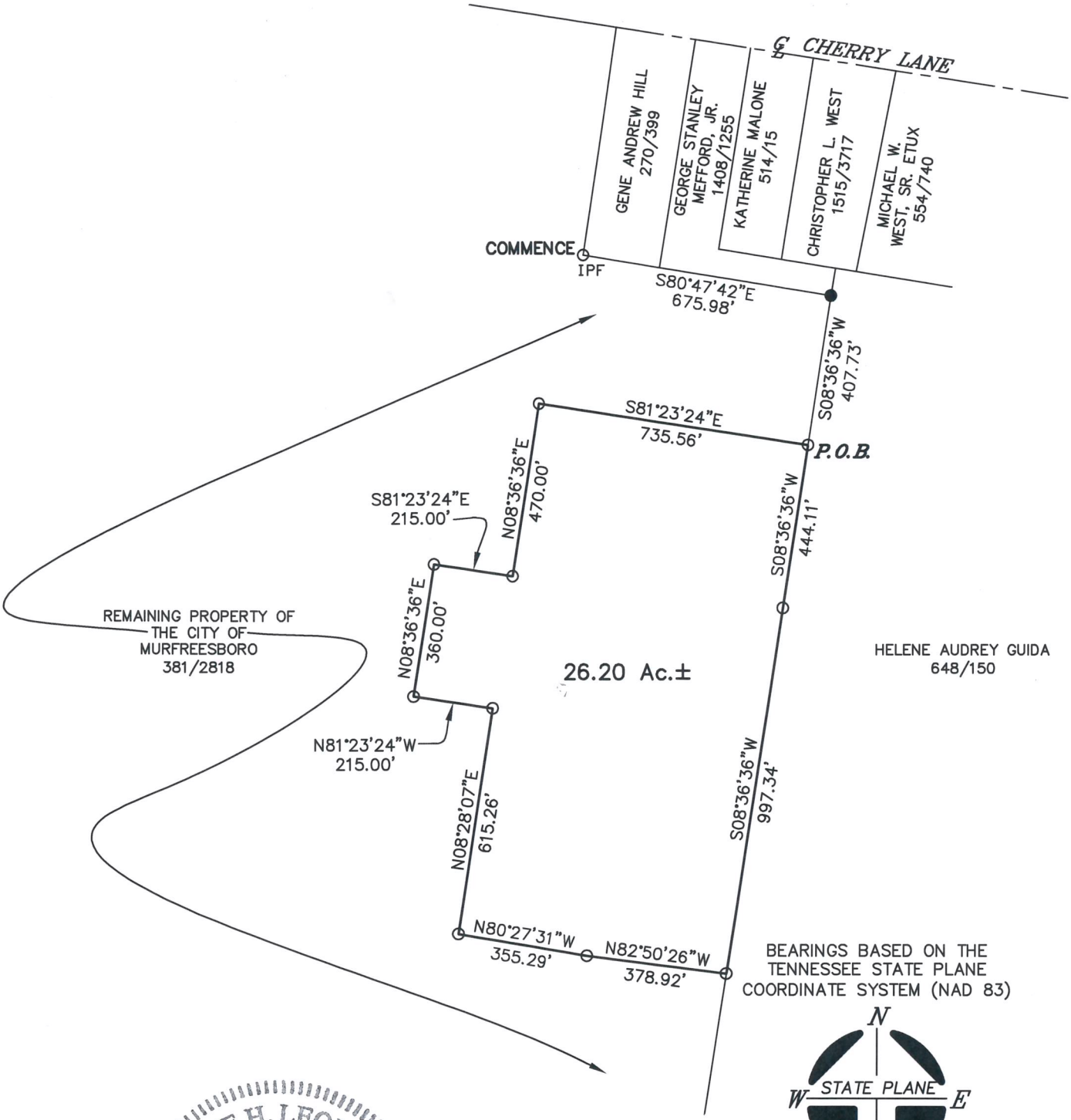
additional capacity within the sewer collection and treatment plant and allows new sewer customers to connect the system.

Fiscal Impacts

Accepting payment of $35,000 per acre for 26.2 acres would reimburse the Water Resources Enterprise fund $917,000.

Attachments:

1. Survey Exhibit for Area used as Soccer Fields on Jordan Farm
2. Jordan Farm Exhibit



JOHNNIE H. LEONARD III
REGISTERED LAND SURVEYOR
TENNESSEE No. 2189

8-15-19

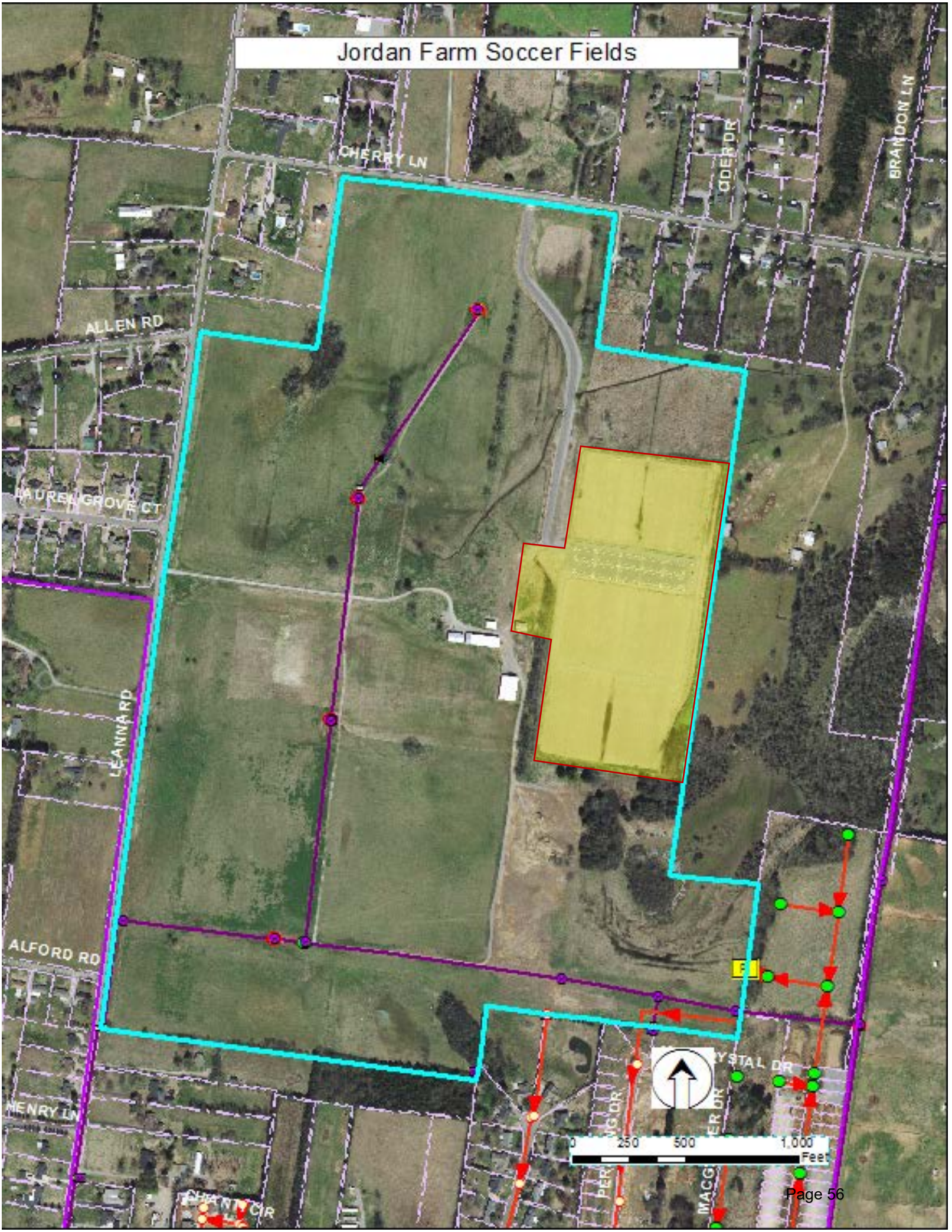
EXHIBIT

SIEGEL SOCCER PARK ANNEX

CITY OF MURFREESBORO

PART OF TAX MAP 58, PARCEL 22.00
RECORD BOOK 381, PAGE 2818
CITY OF MURFREESBORO
AUGUST 2019
SCALE: 1"=400'

HUDDLESTON-STEELE ENGINEERING, INC.
2115 N.W. BROAD STREET, MURFREESBORO, TN 37129
TELEPHONE : 893 – 4084, FAX: 893 – 0080


Jordan Farm Soccer Fields
CHERRY LN
ODER DR
BRANDON LN
ALLEN RD
LAUREN GROVE CT
LEANNA RD
ALFORD RD
HENRY LN
CRYSTAL DR
0 250 500 1,000
Feet

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MEMORANDUM

DATE: August 22, 2019

TO: Water Resources Board

FROM: Darren Gore

SUBJECT: Draft Ordinance for Sanitary Sewer and Wastewater Treatment Allocation to Support Future Land Use Assessment

---

Summary

Request to approve a Sanitary Sewer and Wastewater Treatment Allocation ordinance for future land use per the following categories at the corresponding gallons per day per acre rates:

Future Land Use	*Sfu Eq per Acre*	*gpd per Acre*
Commercial	2.0	520
Industrial	4.0	1040
Park	0.5	130
Low Density Residential	3.0	780
Med Density Residential	5.0	1300
Hi Density Residential	9.0	2340

Background Information

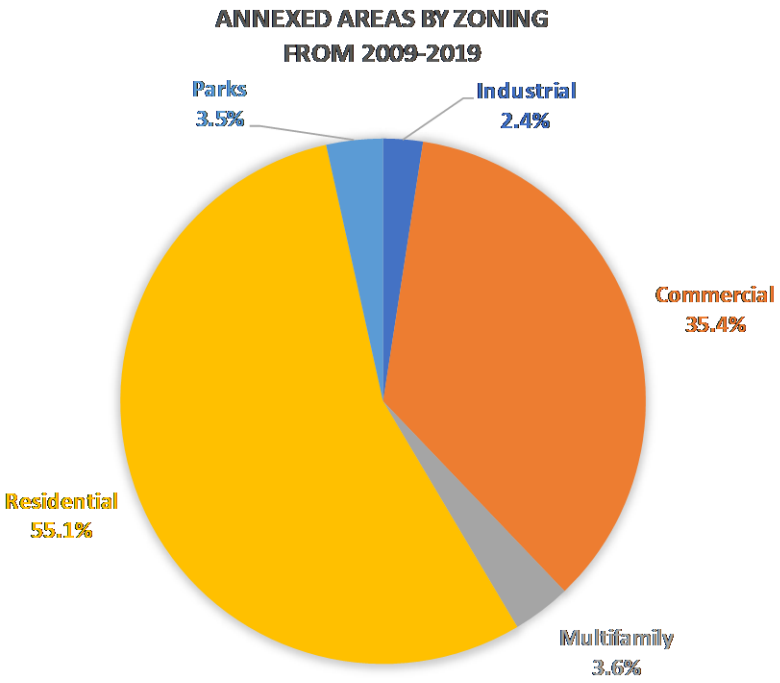
The last 20-yrs of growth in Murfreesboro has dramatically increased the demands on the wastewater collection system. Additionally, the recent Water Resource Recovery Facility (WRRF) expansion coming on-line in August 2017 opened approximately 8 million gallons per day (MGD) of wastewater treatment capacity. A draft ordinance has been prepared to allocate sanitary sewer collection and wastewater treatment on a more proportional basis to undeveloped property for the welfare of the City and its inhabitants.

Federal and state regulations outside the City's purview may restrain the City's ability to obtain additional capacity to support future land use in the City's urban growth boundary. Allocating wastewater treatment and/or sanitary sewer collection capacity will:

- Promote and protect public health and safety
- Enhance the economy by establishing reasonable, orderly, equitable and effective means to allocate wastewater collection capacity
- Assist in uniform and balanced future development to serve the needs of the community and the City's tax digest.

Staff has prepared an analysis to review the Salem Hwy corridor and sanitary sewer service area that was master planned in 1999 and compare it to the current build-out in 2019 to see how much sewer has been allocated, and consequently determine how much sewer capacity is remaining for the areas yet to be developed in this corridor. In summary MWRD has allowed density of development to occur approximately 12% greater than planned, or 4.3 single family units per acre versus the originally planned 3.8 single family units (sfu) per acre. In order to adjust future density in order to get back to the originally proposed density of 3.8 sfu's per acre, a 21% reduction is necessary, or maintaining an average of 3.4 sfu's per acre over the remaining acreage within the New Salem Highway basin.

Using the City's growth (e.g., annexation) history from 2009-2019 per the following pie chart:



And seeking a 3.4 sfu per acre density, the following table provides insight on how the proposed densities and gallons per day per acre rates were determined in the draft ordinance:

Land Use Category	***sfu per acre***	***gpd per acre***	**% total**	**sfu/ac**	
Commercial	*2.0*	*520*	35.4%	0.71	40% Commercial/Ind
Industrial	*4.0*	*1040*	2.4%	0.10	
Park	*0.5*	*130*	3.5%	0.02	
Low Density Res	*3.0*	*780*	44.0%	1.32	
Med Density Res	*5.0*	*1300*	11.0%	0.55	60% Residential
Hi Density Res	*9.0*	*2340*	3.6%	0.32	
				3.02	90% Capacity
				0.30	10% Reserve
				3.32	**AVG. TOTAL**

Based on the recent WRRF upgrade coming online in August 2017, the plant has the capacity to treat approximately 31,000 new single-family units. The density (sfu/acre) table below shows the impact to how much area can be developed. The higher the allowable density, the lower the developable area.

Available Sewer and Acres Served by Density Allocation

24	MGD	2017 WRRF Capacity
16	MGD	2001 WRRF Capacity
8	MGD	Difference
260	gpd	Single Family Unit (sfu) capacity
30,769	sfu's	**Total Single-Family Unit Count Serviceable**

Density sfu/acre	**Developable Acres**
3	10,256
3.32	***9,268***
4	7,692
5	6,154
6	5,128
7	4,396
8	3,846

4,244	acres	Increase in City Limits Between 2009-2019
46,000	acres	Unimproved Areas inside Murfreesboro UGB Total
30,000	acres	Unimproved Areas inside Murfreesboro UGB > 25 acres

Fiscal Impacts

Allocating sewer capacity to developments with less density may have an impact on MWRD's connection fees (a.k.a., system capacity buy-in fees) and associated reserves; however, the City's Urban Growth Boundary (UGB) has much more area than can be served by MWRD's current WRRF capacity. Based on staff's interview conducted with the City of Buford, GA, Buford experienced no fiscal impact in implementing their sewer allocation ordinance in the year 2000. The City of Burford is inside of Gwinnett County, GA which had a population of 596,000 in 2000 compared to 920,000 in 2017. The City of Buford's population

Attachments:

1. Draft Sewer Capacity Allocation Ordinance

DRAFT

ORDINANCE 19-O-XX amending the Murfreesboro City Code, Chapter 33, Water Resources, establishing Sewer Capacity Allocation regulations.

WHEREAS, the City has developed a wastewater collection, treatment, and disposal system that is critical to the health, safety, and general welfare of the public; and

WHEREAS, in 2017, the City expanded a portion of its wastewater system, the Water Resource Recovery Facility, at a cost of approximately $_____million adding approximately 8 million gallons per day (MGD) of wastewater treatment capacity to the City's Sewer System; and

WHEREAS, notwithstanding that expansion, the City's economic development and growth in population over the last 20 years has dramatically increased the demands on the City's wastewater system and at this time the City's projected ability to further expand its wastewater treatment capacity, which would be necessary to support unrestricted future land use in the City's urban growth boundary, is materially restrained by federal and state regulations and other variables beyond the City's control; and

WHEREAS, the capacity of the City's wastewater collection infrastructure varies across the basins and sub-basins that make up the City's entire wastewater system;

WHEREAS, notwithstanding the limitation on expansion of wastewater collection and treatment capabilities, the City's population growth is projected to continue and encouraging economic development within the City benefits residents is instrumental to increasing new employment opportunities, enhancing conveniently available services, and lowering tax obligations directly imposed upon individuals; and

WHEREAS, in order to balance the needs of beneficial economic development with the increases in residential development the City must ensure that its sewer system capacity remains sufficient to support all aspects of a growing community and allocated this limited capacity in a manner deemed in the best interests and general welfare of the City's citizens; and

WHEREAS, the City of Murfreesboro Water Resources Board voted on August 26, 2019, to recommend to the Murfreesboro City Council that it adopt the regulations set forth herein.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MURFREESBORO, TENNESSEE, AS FOLLOWS:

SECTION 1. Chapter 33, Article V., Water Conservation, of the Murfreesboro City Code, as of the first reading of this Ordinance, is re-designated as Chapter 33, Article VI, Water Conservation.

SECTION 2. Chapter 33, Article VI., Sanitary Sewer Special Assessment

Districts, of the Murfreesboro City Code, as of the first reading of this Ordinance, is re-designated as Chapter 33, Article VII, Sanitary Sewer Special Assessment Districts.

SECTION 3. Chapter 33, Article VII., Repurified Water, of the Murfreesboro City Code, as of the first reading of this Ordinance, is re-designated Chapter 33, Article VIII, Repurified Water.

SECTION 4. Chapter 33, Article VIII., Human Excrement Disposal, of the Murfreesboro City Code, as of the first reading of this Ordinance, is re-designated Chapter 33, Article IX, Human Excrement Disposal.

SECTION 5. Chapter 33, Article IV., Sewer Connection Service and Tapping Charges, of the Murfreesboro City Code, is hereby amended by deleting "Sections 33-53—33-100 Reserved" and in lieu thereof inserting "Sections 33-53—33-69 Reserved."

SECTION 6. Chapter 33, of the Murfreesboro City Code, is hereby amended adding a new Article V, to include Sections 33-70 through 33-100 and titled "Sewer Capacity Allocation." This new Article V shall provide as follows:

ARTICLE V. SEWER CAPACITY ALLOCATION

SECTION 33-70 PURPOSES.

The purposes of the regulations contained in this Article are to promote and protect public health and safety; enhance the City's economy by establishing reasonable, orderly, equitable and effective means to allocate wastewater collection capacity; and assist in uniform and balanced future development to serve the needs of the community and the City's tax digest.

SECTION 33-71 SHORT TITLE.

This Article may be cited as the Sewer Capacity Allocation Ordinance.

SECTION 33-72 APPLICABILITY.

This Article shall control the approval of new sewer connections to the extent specified herein. To the extent its provisions conflict with any other provision of the Murfreesboro City Code or any policy of the Water Resources Department, this Article shall supersede such other provisions and control. To the extent the provisions of this Article do not conflict with or otherwise supersede other provisions of the Murfreesboro City Code or any policy of the Water Resources Department, those provisions and policies remain in full force and effect.

SECTION 33-73 DEFINITIONS.

For purposes of this Article, the following words shall have the meanings ascribed to them in this section unless a different meaning is clearly intended from the context:

Available Sewer Capacity means the amount of sewer capacity determined by the Water Resources Department to be available to serve new development projects in accordance with this Article.

Average Daily Usage means a mathematical expression that takes the total volume of water used or proposed to be used during a specified period of time divided by the number of days in that period of time, typically express in terms of million gallons per day (MGD) or gallons per day (gpd).

Capacity means the amount of sewer flow per time that may be handled by the City's wastewater treatment, pumping, and collection system, or any component, basin, sub-basin, or district of such system.

Centralized Wastewater Treatment Facility means the Sinking Creek Treatment Plant operating under National Pollutant Discharge Elimination System (NPDES) permit number TN0022586.

Owner/Developer means the legal owner of a property on which a project is proposed or any person, legal entity, or governmental agency proposing a project on a parcel of property and having financial responsibility for the proposed project.

Peak-to-average ratio means the ratio of the maximum wastewater discharge rate to the monthly average daily discharge rate.

Project means: (1) any proposed construction of a new building, facility, or group of buildings and/or facilities requiring one or more new water meters or new or larger connections to the City's Sewer System; or (2) any proposed renovation of an existing building or facility that requires a new water meter or new or larger connections to the City's Sewer System.

Sewer-capacity-allocation Resolution means a resolution adopted by City Council as provided in Section 33-75(A).

Sewer System means the City's wastewater treatment, pumping, and collection system.

Will-serve Letter means a letter issued by the City of Murfreesboro Water Resources Department to an owner or developer commitment that the City will provide water and/or sewer service to a particular property, subject to the fees and conditions, if any, set forth in the letter or applicable law and Department policies.

SECTION 33-74 SEWER CAPACITY AVAILABLE FOR ALLOCATION; DETERMINATION, REPORTING AND TRACKING.

(A) **Determination of available capacity.** The Water Resources Director will determine the total amount of sewer capacity available for allocation purposes, taking into account the existing (approved or constructed) development projects in the City. This determination shall evaluate the capacity of all treatment facilities used by the City as well as its sewer mains, pumping stations, and other sewer facilities. In addition to determining the system's overall capacity available for allocation, the Water Resources Director may determine the amount of sewer capacity available for allocation within individual basins, sub-basins, and sewer districts.

(B) **Bi-Annual Report.** At least once every two years, the Water Resources Department will present a report on the sewer system's capacity ("Bi-Annual Report") to the Water Resources Board and, after approval by the Board, to the City Council.

(C) **Tracking**. The Water Resources department will track the allocation of sewer capacity and will make allocation information available to the public.

SECTION 33-75 MAXIMUM DAILY WASTEWATER GENERATION ALLOWANCE.

(A) City Council shall have the authority to allocate, by resolution, the sewer capacity of the City's Sewer System among properties located within the City's corporate limits and properties currently located outside the City's corporate limits that are served by the City's Sewer System. Such allocation shall be made by assigning a maximum daily wastewater generation allowance to each property based on the actual or projected land use of the property. Based on the recommendation of the Water Resources Board, City Council, in its discretion, may establish maximum daily waster generation allowances applicable to all areas served or potentially served by the City's Sewer System or establish separate allowances that differ in amount for the sewer system's various basins, sub-basins, and/or districts.

(B) For purposes of allocating the City's sewer capacity, a property's actual or projected land use shall be based on either the property's current zoning or the land use of the property indicated on the City's most recently adopted or amended Future Land Use Plan. In the event of a conflict between the property's current zoning and the land use indicated on the Future Land Use Plan, the property use shall be deemed to be the use that would provide the higher maximum daily wastewater generation allowance. Properties not located within the City's corporate limits as of the effective date of a sewer-capacity-allocation resolution and those properties outside the corporate limits that are not served by the City's Sewer System as of the effective date of a sewer-capacity-allocation resolution shall be assigned a maximum daily wastewater generation allowance of zero gallons per acre.

(C) Projects approved by the City after the effective date of a sewer-capacity-allocation resolution shall maintain an average wastewater generation at or below the maximum daily wastewater generation allowance for the development's land-use category established in the sewer-capacity-allocation resolution.

(D) At least once every two years, City Council shall review the existing allocation of the City's Sewer System's capacity and the established maximum daily wastewater generation allowances and adopt any changes to the allocation and/or allowances that are necessary and appropriate to fulfill the purpose and intent of the Sewer Capacity Allocation Ordinance. In adopting changes to the allocation and/or allowances, City Council may consider the recommendations presented by the Water Resources Department in its Bi-annual Report, the recommendations of the City Manager, and other factors relevant to fulfilling the purpose and intent of the Sewer Capacity Allocation Ordinance.

SECTION 33-76 DETERMINATION OF DAILY AVERAGE USAGE.

The water-meter readings by the Water Resources Department (or the Consolidated Utility District of Rutherford County, as applicable) shall be determinative and govern daily average usage. Nothing herein, however, shall prevent the developer from installing and maintaining a meter, provided that such meter is of a type approved by the Water Resources Department and measures water consumed on the property and not returned to the City's Sewer System. Annual calibration of privately installed meters by an independent entity shall be part of the property owner's ongoing responsibility under this Article.

SECTION 33-77 APPLICATION FOR ALLOCATION.

An owner or developer of a project shall apply for a sewer allocation at the time the owner requests a "will serve" letter from the Water Resources Department. The application shall include: (a) any documentation necessary to demonstrate the amount of the request allocation; and (b) the proposed land-use category for the project. The Water Resources Department may establish additional application policies and procedures reasonably necessary to achieve the purpose and intent of the Sewer Capacity Allocation Ordinance.

SECTION 33-78 COMPLIANCE.

(A) After the City has issued a certificate of occupancy for a project, the Water Resources Department shall monitor the water consumption at or within the project for such time as is reasonably necessary under the circumstances to establish the normal water usage at or within the project.
(B) In the event the daily average usage is greater than the maximum daily wastewater generation allowance established for the project, the project's owner shall be assessed an additional service fee for exceeding the limits established in the sewer-capacity-allocation resolution then in effect. This additional service fee shall be calculated and assessed, along with any applicable administrative fees, in accordance with the sewer-capacity-allocation resolution then in effect.
(C) An additional fee may be assessed, as provided by the sewer-capacity-allocation resolution then in effect, if the peak-to-average ratio exceeds 3.0.

SECTION 33-79 PETITION FOR ADDITIONAL ALLOWANCE.

(A) If the Water Resources Department determines that a project proposed by an applicant for sewer service is likely to exceed the maximum daily wastewater generation allowance established for the proposed land use and the City's Sewer System capacity is sufficient to serve the project, the applicant may petition the City for a waiver of the applicable limits. Upon review by City staff, the application and staff recommendation shall be presented to the City Council to approve or deny the request for an additional allowance.
(B) In evaluating a petition, City Council, Water Resources Board, and staff may consider the following factors:
  (1) The current performance of the City's wastewater treatment facilities;
  (2) The character and nature of wastewater that is likely to be discharged from the project relative to any applicable limits or restrictions established by federal, state, or local law;
  (3) The current daily flow at the City's treatment facility that would receive the project's wastewater;
  (4) The impact of additional flow on the receiving treatment plant's ability to achieve NPDES permit limits; and
  (5) The available hydraulic capacity of the City's sewer lines and other sewer system components.
(C) The City Council may authorize an additional daily wastewater generation allowance to a project provided:
  (1) The technical factors listed set forth in subsection (B), either individually or collectively, do not militate against the approval of the requested allowance;
  (2) Sufficient sewer capacity exists within the system and within the basin or sub-basin in which the project is located;
  (3) The proposed project is, in the opinion of the City Council, consistent with the City's adopted land use plans and policies concerning growth and development; and

(4) The additional daily wastewater generation allowance granted by the City is not greater than ten percent (10%) of the total available capacity of the basin or sub-basin in which the project is located.

Provided the application satisfies these requirements, the City Council, in deciding whether to authorize an additional allowance, may consider any other factor identified in the Council's deliberations related to whether a particular application promotes or undermines public health or safety or the general welfare of the City and its residents.

(D) The City Council may condition the approval of an additional allowance on the owner or developer incorporating certain public infrastructure improvements into the project's site plan.

(E) In the event City Council grants an additional allowance, the applicant shall remit, as provided in Section 33-50(a)(2), a one-time fee equal to $2,550.00 for each 260 gallons per day of additional volume over the maximum daily wastewater generation allowance applicable to the project plus any applicable special sanitary sewer assessment fees.

SECTIONS 33-80—33-100 RESERVED."

SECTION 6. That this Ordinance shall take effect fifteen (15) days after its passage upon second and final reading, the public welfare and the welfare of the City requiring it.

Passed:

1st reading _____

2nd reading _____

_____
Shane McFarland, Mayor

ATTEST:

_____
Melissa B. Wright
City Recorder

APPROVED AS TO FORM:

_____
Adam F. Tucker
City Attorney

SEAL

WATER RESOURCES

DASHBOARD PERFORMANCE

July 2019

MWRD FY2019-2023 CIP

NO.	PROJECT	2018-2019 2018	2019-2020 2019 Issue	2020-2021 2020 Issue	2021-2022 2021 Issue	2022-2023 2022 Issue	TOTAL
	Construction- Northeast Regional PS & Force Main						$0
	Construction- Biosolids Processing Equipment						$0
	TOTAL Capital Improvements funded from **Debt Service**	$0	$0	$0	$0	$0	$0

NO.	PROJECT	2018-2019 2019 FY	2019-2020 2020 FY	2020-2021 2021 FY	2021-2022 2022 FY	2022-2023 2023 FY	TOTAL
	Sewer rehab- Account 335	$1,400,000	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$6,400,000
	Meters, Water/Sewer Taps, Hydrants - 280, 290, 300, 310	$435,000	$435,000	$435,000	$435,000	$435,000	$2,175,000
	Water lines- Account 320	$350,000	$350,000	$350,000	$350,000	$350,000	$1,750,000
	Sewer Lines - Account 330	$350,000	$350,000	$350,000	$350,000	$350,000	$1,750,000
	Biolsolids Processing Equip & Storage Sinking Fund	$500,000	$500,000	$500,000	$500,000	$500,000	$2,500,000
	Walter Hill Dam Repair/Remediation Sinking Fund	$125,000	$125,000	$125,000	$125,000	$125,000	$625,000
	Lift Station Replacement Sinking Fund	$250,000	$250,000	$250,000	$250,000	$250,000	$1,250,000
	NE Regional PS & FM Sinking Fund	$500,000	$500,000	$500,000	$500,000	$500,000	$2,500,000
	GAC Replacement	$110,000	$110,000	$110,000	$110,000	$110,000	$550,000
	Vehicle and Equipment Replacement	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$7,500,000
	TOTAL Capital Improvements funded from **Rates**	$5,520,000	$5,370,000	$5,370,000	$5,370,000	$5,370,000	**$27,000,000**

NO.	PROJECT	2018-2019 2019 FY	2019-2020 2020 FY	2020-2021 2021 FY	2021-2022 2022 FY	2022-2023 2023 FY	TOTAL
	W&S CAPITAL IMPROVEMENT PROJECTS						
	Misc FY19 Working Reserve Commitments	$1,800,000					$1,800,000
	Biolsolids Processing Equipment & Storage Addition	$1,000,000	$1,000,000	$8,500,000	$5,500,000		$16,000,000
	Overall Creek Pump Station Upgrade	$350,000	$1,500,000	$3,500,000	$3,500,000		$8,850,000
	NE Regional Engineering Design	$500,000	$1,500,000	$250,000	$250,000	$250,000	$2,750,000
	NE Regional P.S. & Force Main		$500,000	$2,500,000	$10,000,000	$7,500,000	$20,500,000
	Cherry Lane / Sazerac Sanitary Sewer		$1,000,000	$1,500,000			$2,500,000
	SR840 Interchange Area Sanitary Sewer	$200,000	$1,100,000	$1,100,000			$2,400,000
	Hwy96 Park Property Area Sewer		$300,000	$2,000,000	$2,000,000		$4,300,000
	MWRRF Wet Weather Treatment Train Impr		$50,000		$2,500,000	$2,500,000	$5,050,000
	Lift Station Rehab/Replacement (#9) Ransom Dr.	$935,000					$935,000
	Mill Street Painting, Halls Hill and Tiger Hill Tank Repairs		$2,550,000				$2,550,000
	WTP Membrane Replacement			$650,000			$650,000
	Direct Potable Reuse Demonstration			$150,000	$350,000		$500,000
	Stones River Water Qual Sampling / NPDES Permitting	$500,000	$150,000	$150,000	$150,000	$150,000	$1,100,000
	Subtotal CAPITAL PROJECTS	$5,285,000	$9,650,000	$20,300,000	$24,250,000	$10,400,000	$69,885,000
	TRANSPORTATION (Water/Sewer Imp.)						
	Bradyville Pike			$1,500,000	$1,500,000	$500,000	$3,500,000
	Jones Blvd Widening		$500,000	$500,000			$1,000,000
	Cherry Lane Repurified Main Extension (14,600 LF)		$825,000	$1,000,000			$1,825,000
	Cherry Lane Sanitary Sewer Construction	$75,000	$500,000	$1,500,000			$2,075,000
	SR 99 Widening- Old Fort to Cason Lane		$500,000	$500,000	$500,000		$1,500,000
	St. Clair St.		$500,000				$500,000
	John Rice Blvd & Rucker Lane		$200,000				$200,000
	Maney Avenue Reconstruction - Phase 2		$250,000	$250,000			$500,000
	Wilkinson Pike Reconstruction (MCP to TL)		$650,000	$650,000			$1,300,000
	Subtotal TRANSPORTATION PROJECTS	$75,000	$3,925,000	$5,900,000	$2,000,000	$500,000	$12,400,000
	REHABILITATION						
	Sewer Rehabiliation - Maintenance Contract	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$5,000,000
	INFORMATION TECHNOLOGY PROJECTS						
	IT/Computer Systems Hardware Upgrades	$50,000	$100,000	$100,000	$100,000	$100,000	$450,000
	Electronic Content Management (Scanning/Imaging)		$150,000	$150,000	$150,000		$450,000
	IT Design Services & Consulting	$100,000	$100,000	$100,000	$50,000		$350,000
	Comp Maintenance Management System (CMMS)		$400,000	$600,000			$1,000,000
	Subtotal INFORMATION TECHNOLOGY PROJECTS	$150,000	$750,000	$950,000	$300,000	$100,000	$2,250,000
	TOTAL Projects from **Working Capital Reserves**	**$6,510,000**	**$15,325,000**	**$28,150,000**	**$27,550,000**	**$12,000,000**	**$89,535,000**

PROJECTED RESERVE FUND BALANCE REVENUE (TAPS)	$7,200,000	$7,000,000	$7,000,000	$7,000,000	$7,000,000
SINKING FUND DEPOSITS TO RESERVES FROM RATES	$2,775,000	$2,625,000	$2,625,000	$2,625,000	$2,625,000
SECURED MIN. BALANCE FOR WORKING CAPITAL RESERVES	$22,351,742	$22,798,777	$23,254,752	$23,719,847	$24,194,244
PROJECTED WORKING CAPITAL RESERVE BALANCE	$75,548,239	$69,848,239	$51,323,239	$33,398,239	$31,023,239
FUNDS ABOVE SECURED MINIMUM BALANCE	**$53,196,497**	**$47,049,462**	**$28,068,487**	**$9,678,392**	**$6,828,995**

***Preliminary Draft* 5-YR CAPITAL IMPROVEMENTS PLAN (CIP)**
STORMWATER UTILITY FUND, FY19-23

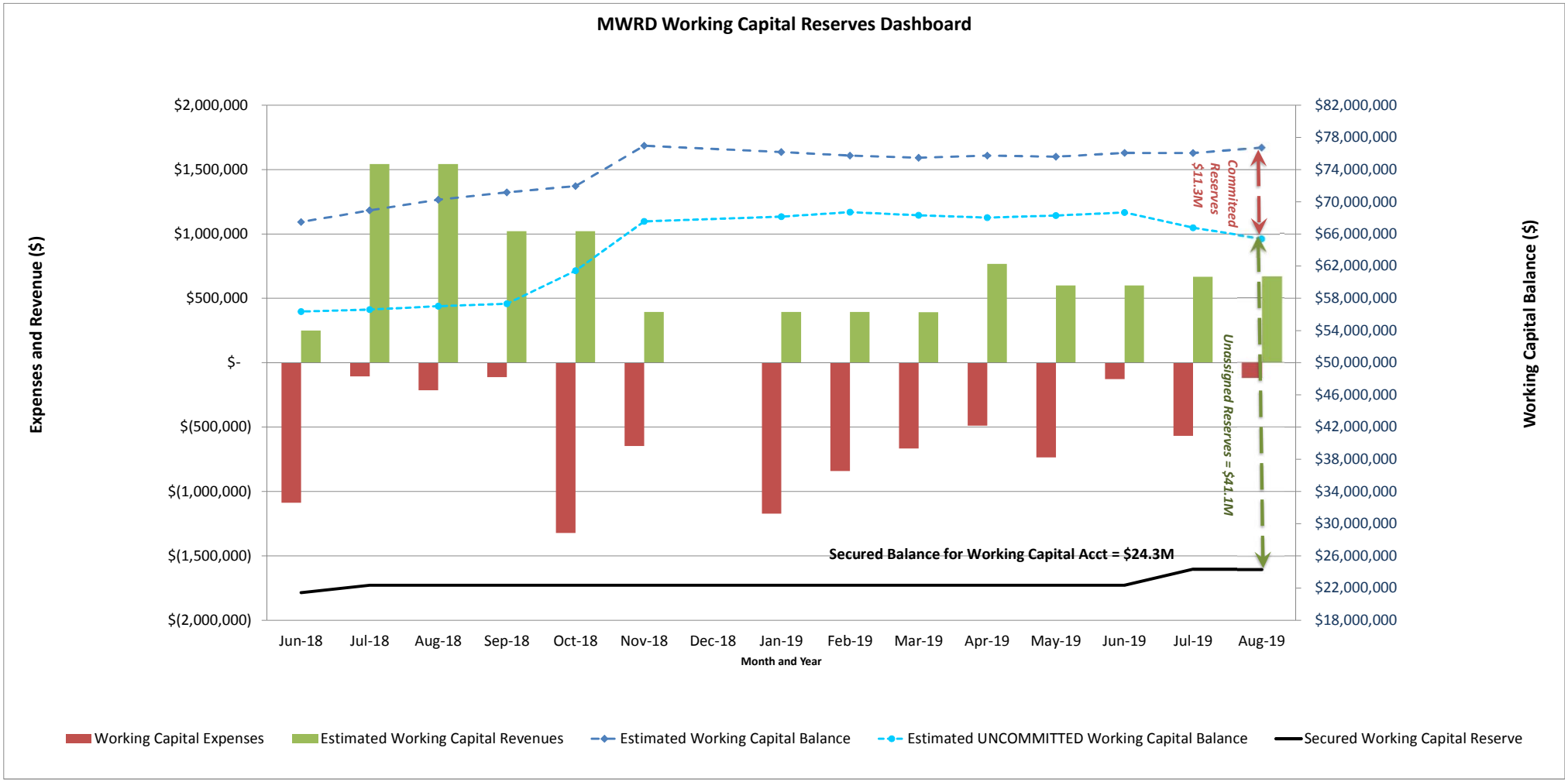
NO.	PROJECT	Originator	2018-2019 2019 FY	2019-2020 2020 FY	**2020-2021 2021 FY**	**2021-2022 2022 FY**	**2022-2023 2023 FY**	**TOTAL**
			Projected	*Budget*	*Pro Forma*	*Pro Forma*	*Pro Forma*	
	Neighborhood Projects (NP)							
NP-1	Memorial Blvd / Haynes Dr. Drainage Improvements	City Eng	$0	$125,000	$50,000			$175,000
NP-2	Mitchell-Nielson Drainage Project	City Eng	$50,000	$50,000				$100,000
NP-3	Huntwood/Leaf Ave Neighborhood Drainage Imp.	City Eng	$0	$100,000	$100,000			$200,000
NP-4	Southern Meadows / Kimbro Woods Drainage Imp.	City Eng	$25,000	$500,000	$500,000			$1,025,000
NP-5	Liberty Dr. / Thatcher Trace Spring Box	City Eng	$0	$50,000	$75,000			$125,000
NP-6	Pennington Drive Drainage Repair/Upgrade (Added)	City Eng						$0
NP-7	Gateway Pond Repair	Eng/MRSD						$0
NP-8	Hardwood Drive Drainage Upgrade (Added)	City Eng	$0	$250,000				$250,000
NP-9	Pacific Place/Riverrock Blvd Drainage Imp.	City Eng	$0	$0	$0			$0
	Subtotal		$75,000	$1,075,000	$725,000			$1,875,000
	Water Quality Improvement (Compliance) Projects (WQ)							
WQ-1	Town Creek Bioretention BMP's @ Cannonsburgh	MWRD						$0
WQ-2	Molloy Lane Water Quality Pond	MWRD		$25,000	$125,000	$75,000		$225,000
WQ-3	Rosebank Springs Constructed Wetlands	City Eng	$35,000	$35,000	$165,000	$115,000		$350,000
WQ-4	Lee's Branch Stream Restoration	City Eng		$25,000				$25,000
WQ-5	West Fork Stones River at Cason Trail; bank repair	MWRD	$40,000	$140,000				$180,000
WQ-6	Bear Branch Water Quality Mitigation	City Eng						$0
WQ-7	Sinking Creek Headwater protection BMP	MWRD/Eng		$30,000	$50,000	$150,000	$150,000	$380,000
WQ-8	Todd's Lake Regional Wetlands Improvements	City Eng						$0
WQ-9	Hooper's Bottom Regional Water Quality Project	City Eng	$25,000	$25,000	$150,000		$175,000	$375,000
WQ-10	Lytle Creek/Ridgley Road Bacteriological Reduction (Added)	MWRD	$10,000	$15,000	$75,000	$25,000		$125,000
WQ-11	Memorial Blvd/VA Pond Trash Rack (Added)	MWRD						$0
WQ-12	Spence Creek Restoration	MWRD/Eng	$25,000	$25,000	$25,000	$25,000		$75,000
WQ-13	E. Lokey Ave Trash Rack at Sinking Creek	MWRD		$30,000	$75,000			$105,000
WQ-14	Sinking Creek/ Northfield Blvd Commercial Retrofit Study/Project	MWRD	$10,000	$25,000	$50,000	$100,000		$185,000
WQ-15	Overall Street retrofit/ bioretention - streetscape	MWRD		$35,000	$100,000			$135,000
WQ-16	Downtown planter box retrofits study/project	MWRD	$10,000	$50,000	$50,000			$110,000
	Subtotal		$155,000	$460,000	$865,000	$490,000	$325,000	$2,295,000
	Public Drainage/Streets Participation Projects (PD)							
PD-1	Maney Avenue Phase 2	City Eng	$50,000					$50,000
PD-2	Town Creek Conveyance (Murfree Springs to Cannonsburgh)	City Eng	$50,000	$500,000	$250,000	$100,000		$900,000
PD-3	Maple St. Alley Permeable Paver Project	City Eng						$0
	Subtotal		$100,000	$500,000	$250,000	$100,000		$950,000
	Totals		$ 330,000	$2,035,000	**$ 1,840,000**	**$ 590,000**	**$ 325,000**	**$ 5,120,000**

EFFECTIVE UTILITY MANAGEMENT

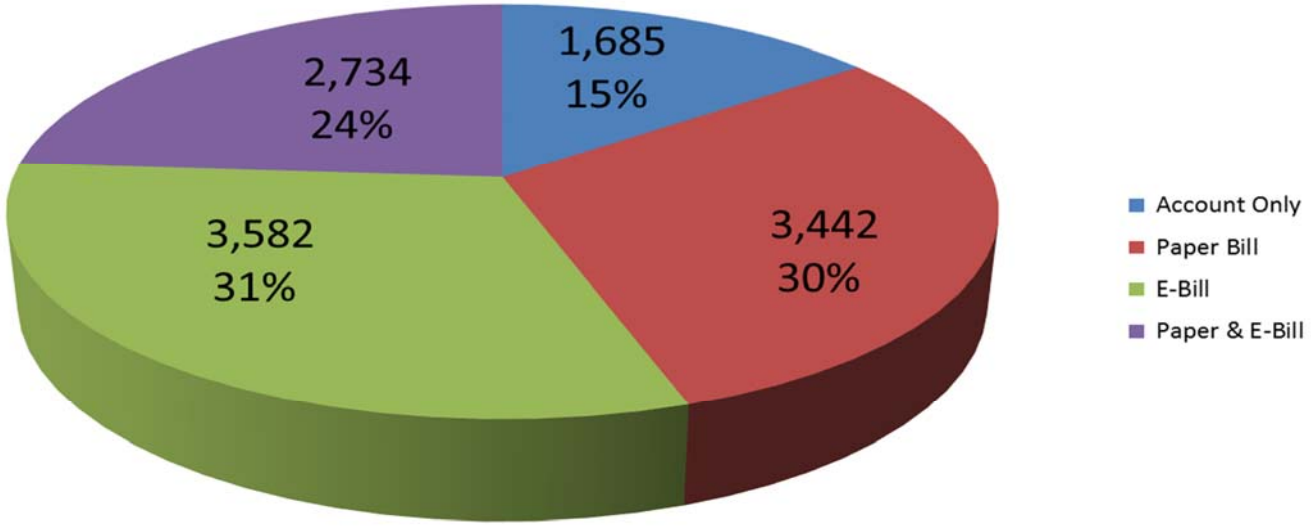
Financial Viability

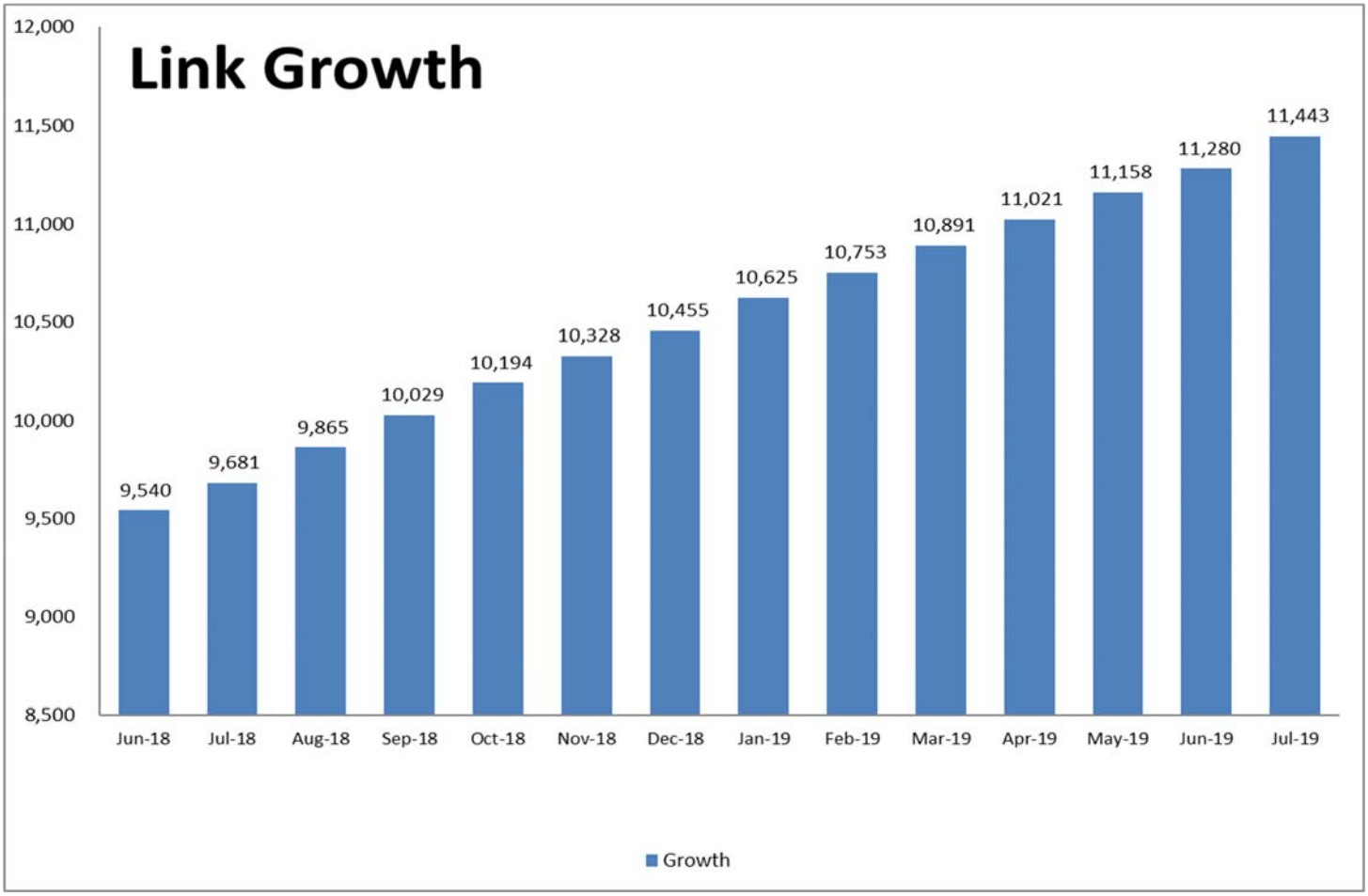
MWRD WORKING CAPITAL ACCOUNT SUMMARY

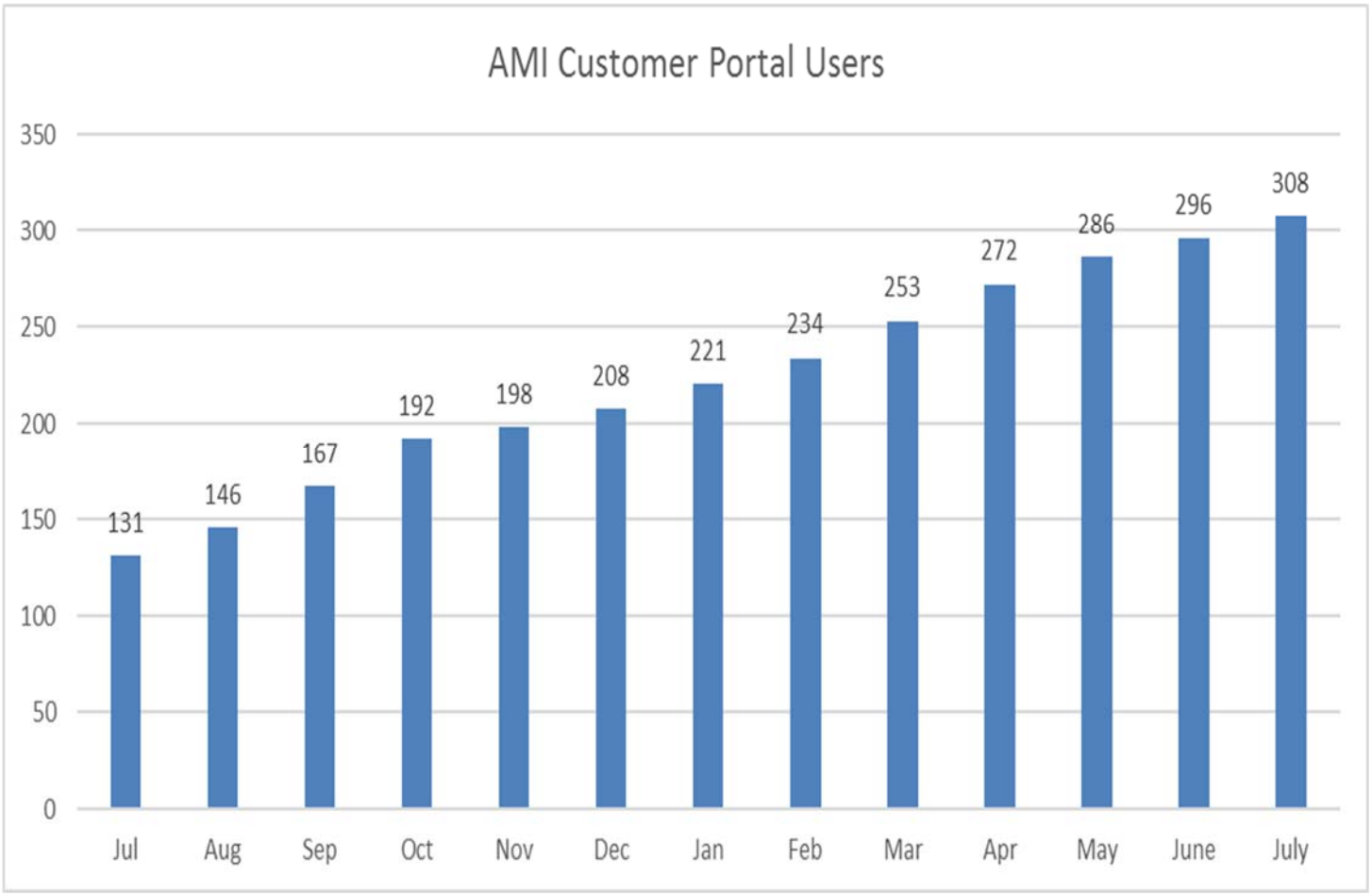
ESTIMATED Working Capital at 7/31/19			
Board Designated (System Dev, Assessments, etc) as of 6/30/18		$ 31,858,736	
Undesignated Excess Funds as of 6/30/18		41,978,125	
Estimated Reserve Revenue thru 6/30/19		10,006,343	
Estimated Reserve Expenditures thru 6/30/19		(7,119,858)	
			76,723,346
COMMITTED Reserves at 7/23/19			
Sanitary Sewer 2019/20 Rehabilitation Contract	3,842,301		
Hobas Pipe Materials Testing	11,720		
Waste Load Allocation Model Additions	75,000		
CIS Software Upgrade V4	343,000		
Walter Hill Dam Change Order	75,503		
24" Repurified PVC Pipe (O&M, Coleman Farm)	143,640		
Purchase of Two (2) Aerators at WRRF	255,348		
SSR Task Order - Mill, Tiger, Halls Hill Tank Painting	167,670		
Main Stay Suites Sewer Upsizing Participation	45,300		
SSR Task Order 201 Facilities Plan	238,968		
SSR Task Order WRRF Capacity Study	21,177		
SSR Task Order Overall Creek PS Capacity Study	34,421		
Sewer Participation - Brinkley Ave, Farrer Property	42,870		
Biosolids Thermal Dryer Install (JBS & MR)	152,965		
Overall Creek P.S. Updgrades (VFD's)	351,042		
S&ME - 2019 Sewer Rehab Design	318,379		
WRRF Aerator 2A Gearbox Replacement	130,930		
Walter Hill Dam Remediation	376,593		
Biosolids Small-scale Thermal Dryer	216,250		
H-S Blackman Park Sewer Design	180,000		
Water Line Replacement @ Airport Terminal	56,000		
SRWTP Raw Water Pumps Replacement	44,700		
SEC Jones Blvd Utility Design Proposal	14,225		
Northeast Regional PS & Conv - SSR	1,966,459		
Waste Load Allocation Study	138,197		
Bradyville Pike Utility Design - Neil-Schaffer	22,710		
Wilkinson Pike Utilties Design	10,190	9,275,558	
APPROVAL Requests at 8/27/19			
CIA - Joe B. Jackson West P.S. and Sewer Design	39,000		
JBS Task Order 19-06 - #5 Raw Water Pump Repair	28,000		
Westwind Reserve Sewer Participation	105,631		
S&ME CCTV HOBAS Inspection	50,500		
Jordan Farm Soccer Field Reimbursment	(917,000)	(693,869)	
BALANCE of Working Capital at 8/27/19 after COMMITMENTS			**$ 68,141,657**
DESIGNATED Projects Pending			
CCTV Inspection of HOBAS Pipe	400,000		
Tank Painting (Mill, Tiger, Halls Hill)	2,300,000	2,700,000	
ESTIMATED UNCOMMITTED Working Capital Reserves as of August 27, 2019			**$ 65,441,657**
SECURED FY19-20 Operating and Maintenance Expenses			**$ 24,331,276**
UNASSIGNED Working Capital Funds (Est. Uncommitted - Secured)			**$ 41,110,381**

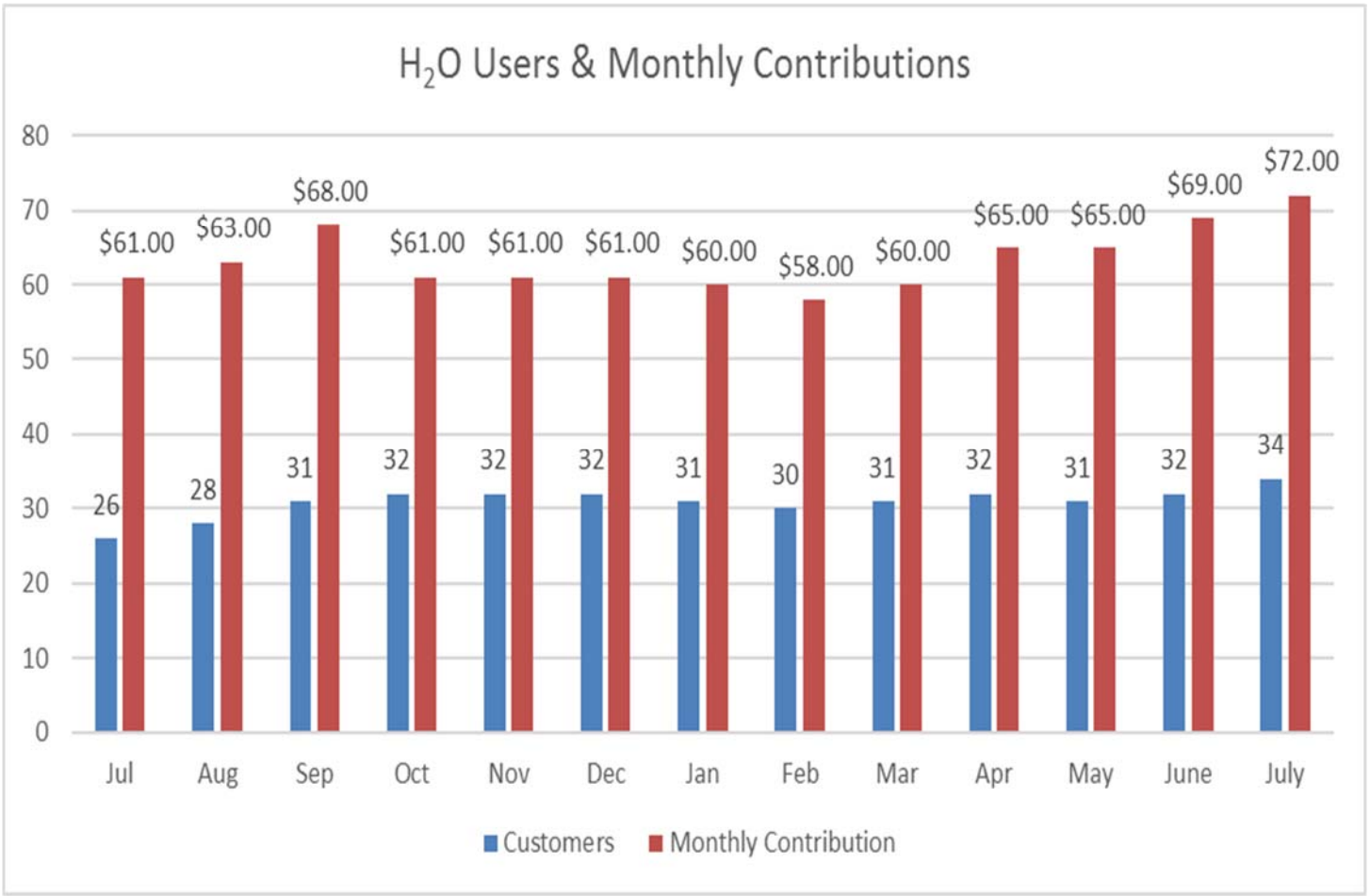

MWRD Working Capital Reserves Dashboard
Expenses and Revenue ($)
Working Capital Balance ($)
$2,000,000
$1,500,000
$1,000,000
$500,000
$-
$(500,000)
$(1,000,000)
$(1,500,000)
$(2,000,000)
$82,000,000
$78,000,000
$74,000,000
$70,000,000
$66,000,000
$62,000,000
$58,000,000
$54,000,000
$50,000,000
$46,000,000
$42,000,000
$38,000,000
$34,000,000
$30,000,000
$26,000,000
$22,000,000
$18,000,000
Jun-18
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
Jul-19
Aug-19
Month and Year
Commited Reserves $11.3M
Unassigned Reserves = $41.1M
Secured Balance for Working Capital Acct = $24.3M
Working Capital Expenses
Estimated Working Capital Revenues
Estimated Working Capital Balance
Estimated UNCOMMITTED Working Capital Balance
Secured Working Capital Reserve

Infinity.Link Customers as of July 2019 = 11,443

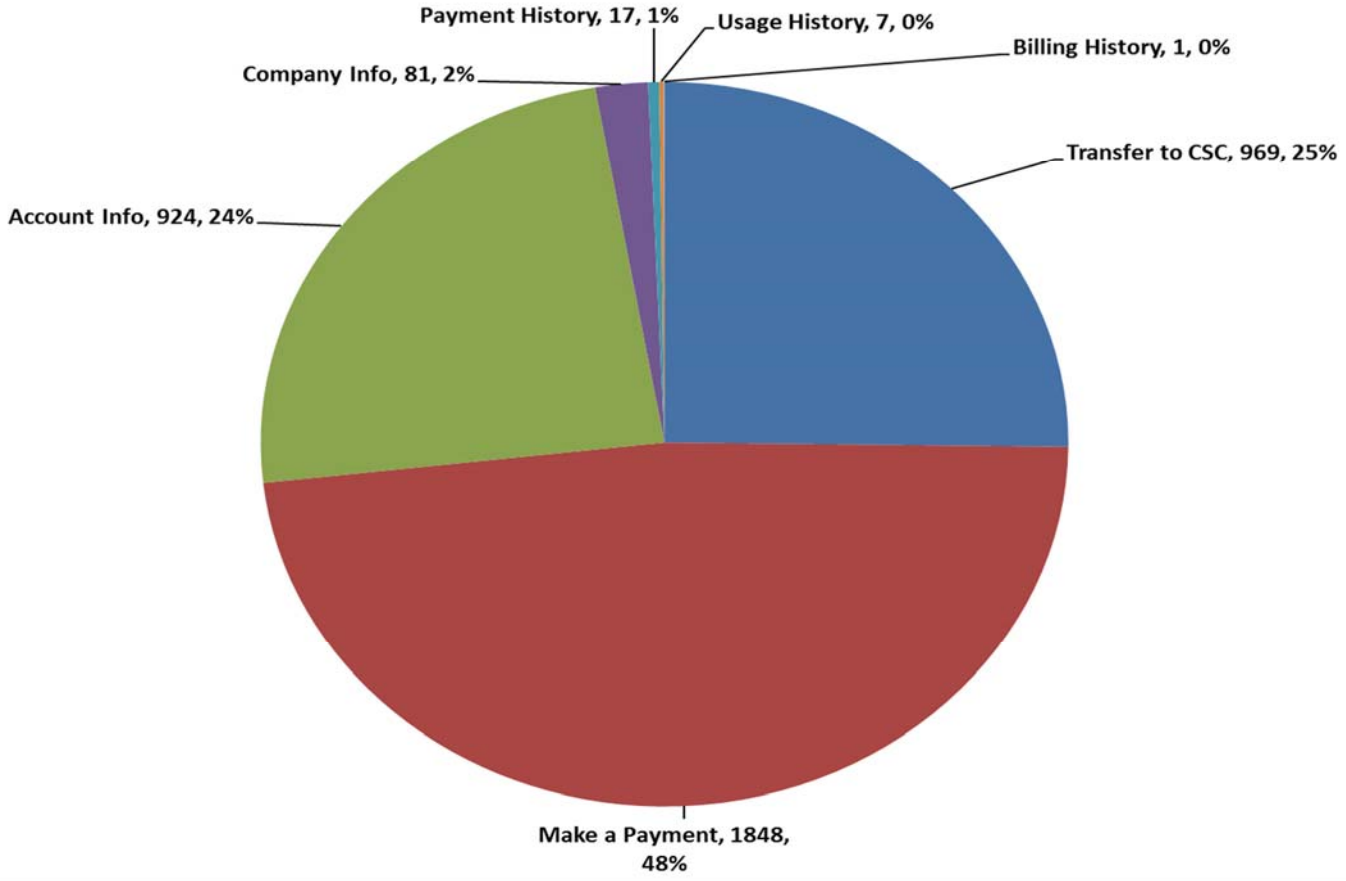




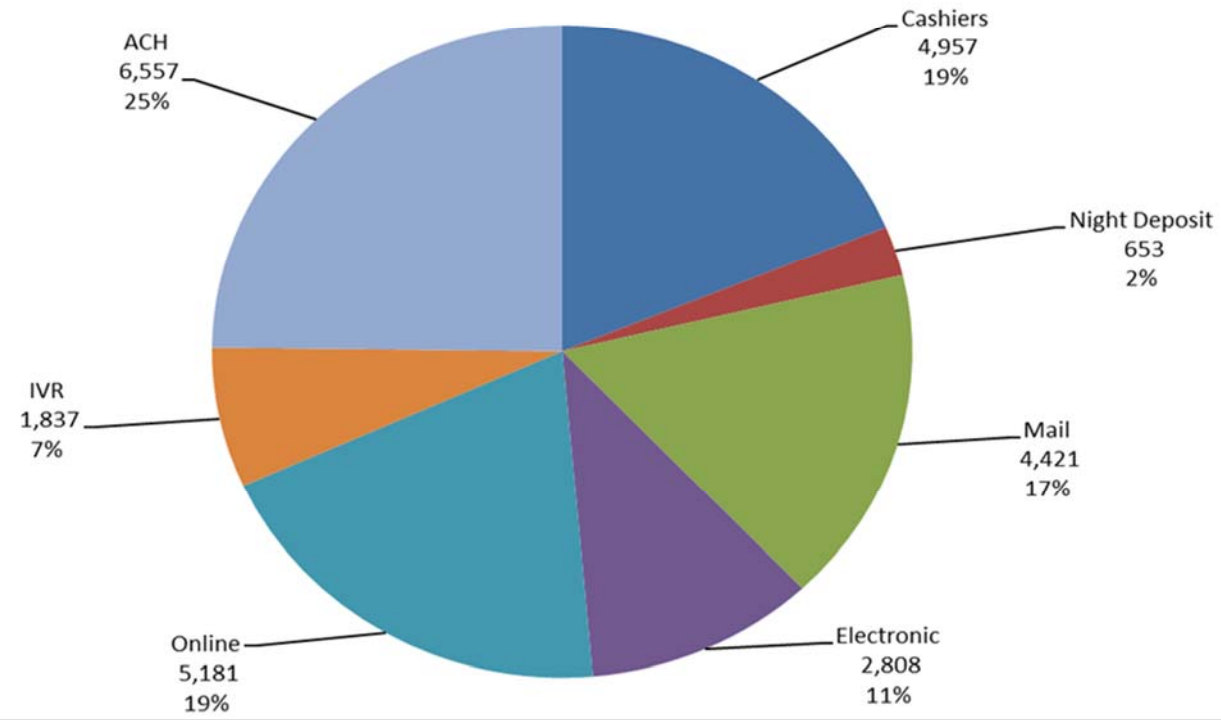

AMI Customer Portal Users
350
300
250
200
150
100
50
0
131
146
167
192
198
208
221
234
253
272
286
296
308
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
June
July

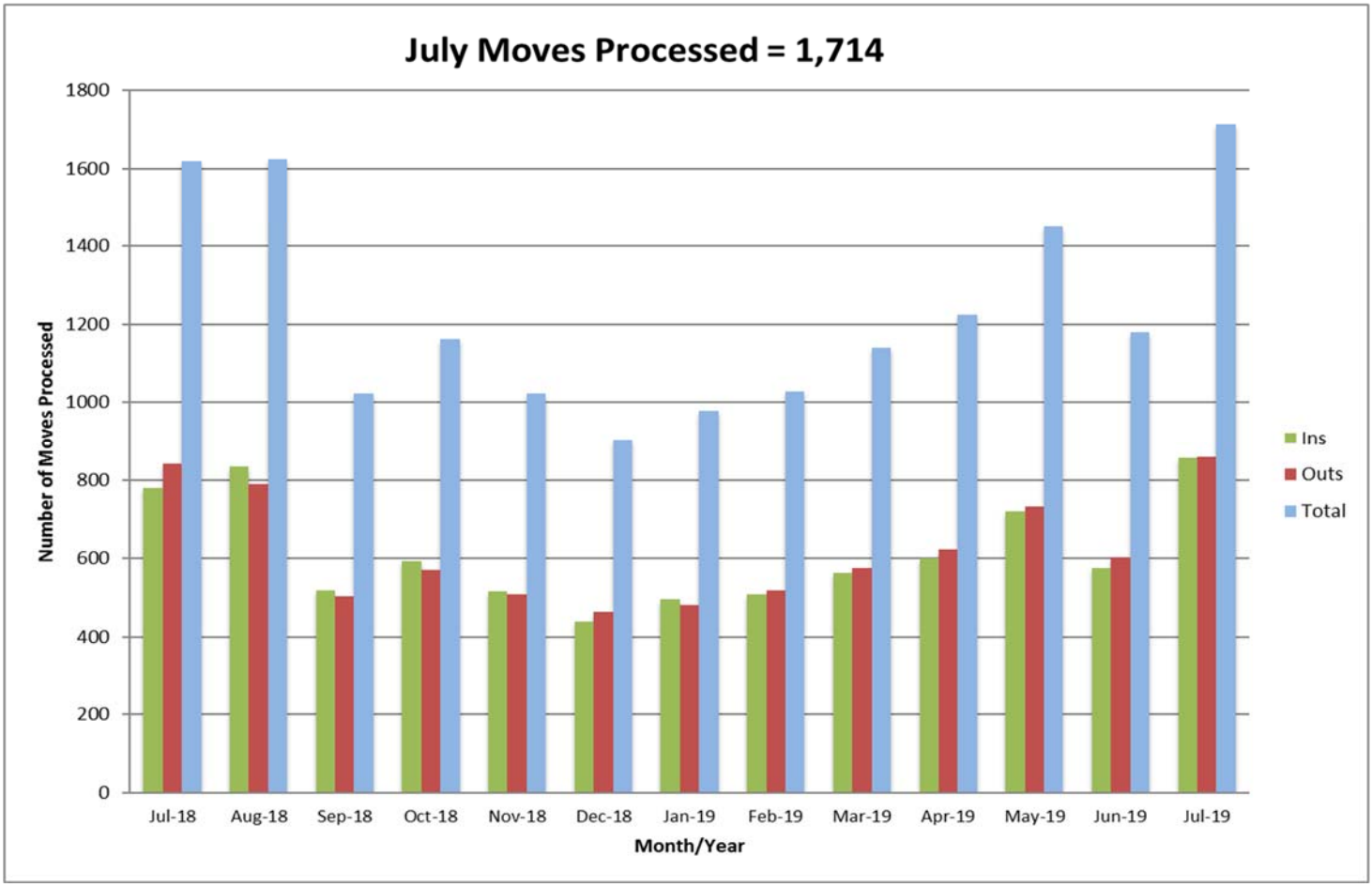

H2O Users & Monthly Contributions
80
70
60
50
40
30
20
10
0
$61.00
$63.00
$68.00
$61.00
$61.00
$61.00
$60.00
$58.00
$60.00
$65.00
$65.00
$69.00
$72.00
26
28
31
32
32
32
31
30
31
32
31
32
34
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
June
July
Customers
Monthly Contribution

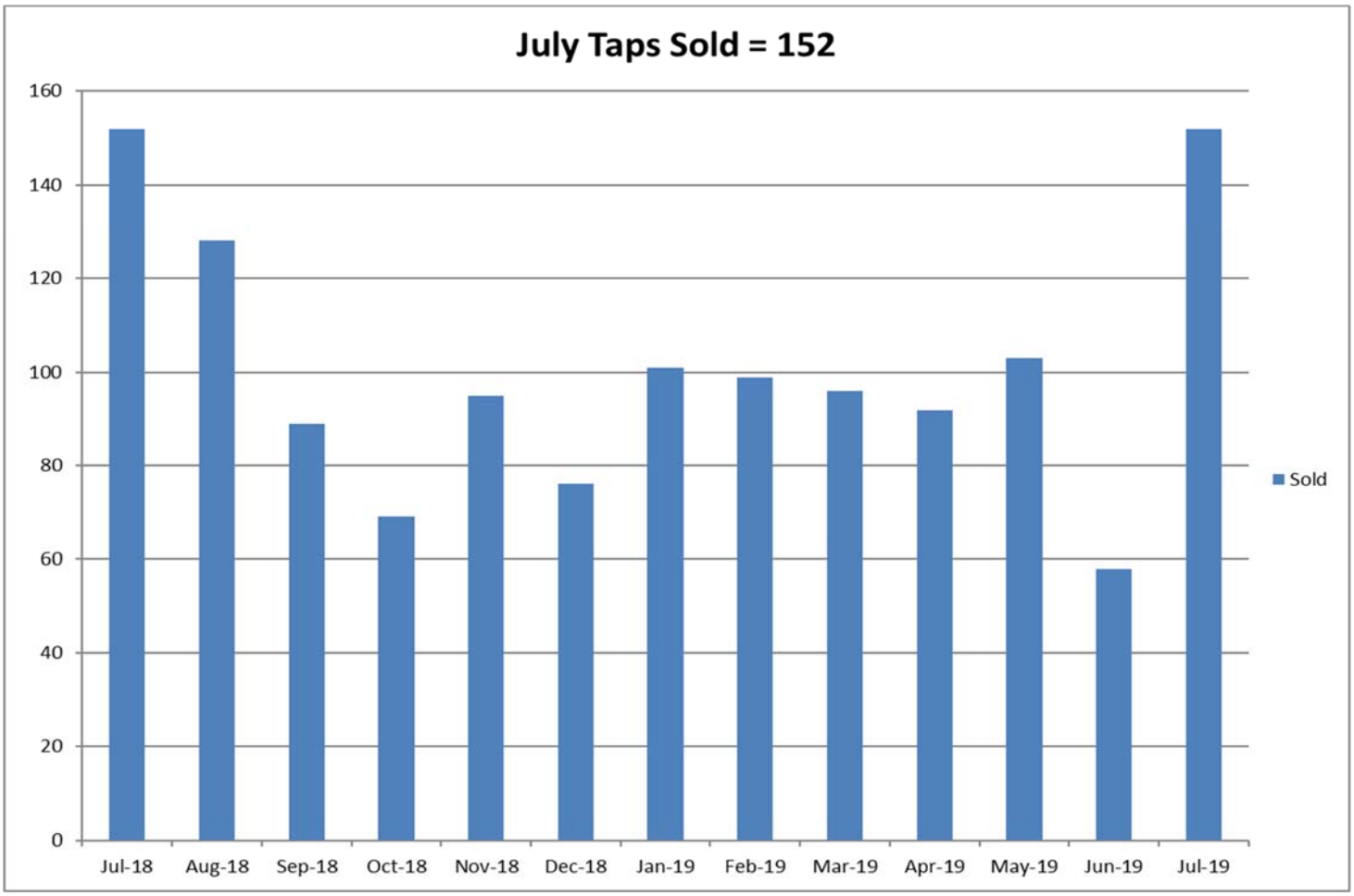
IVR Calls From 07/01-07/30/2019 = 3,847

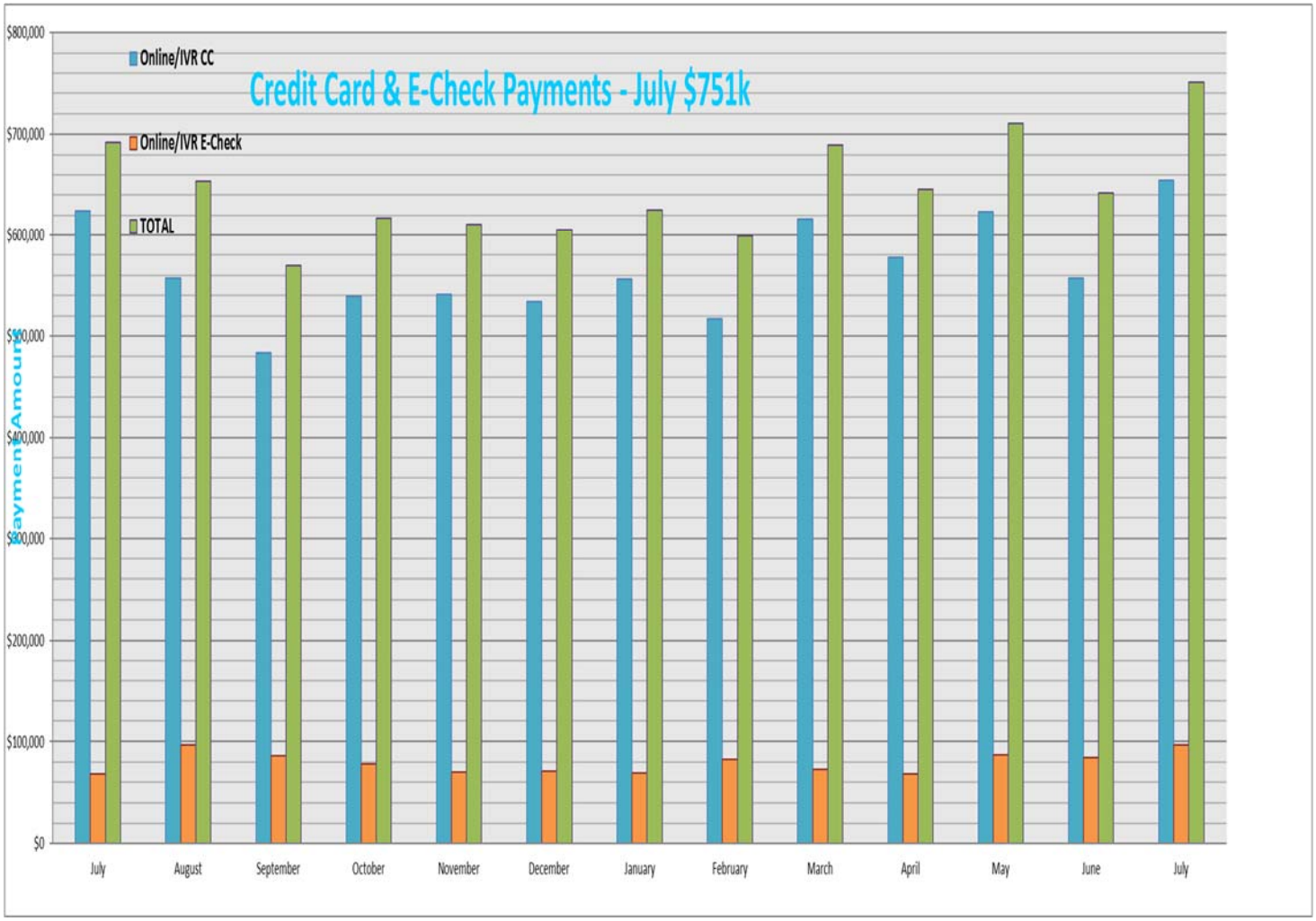


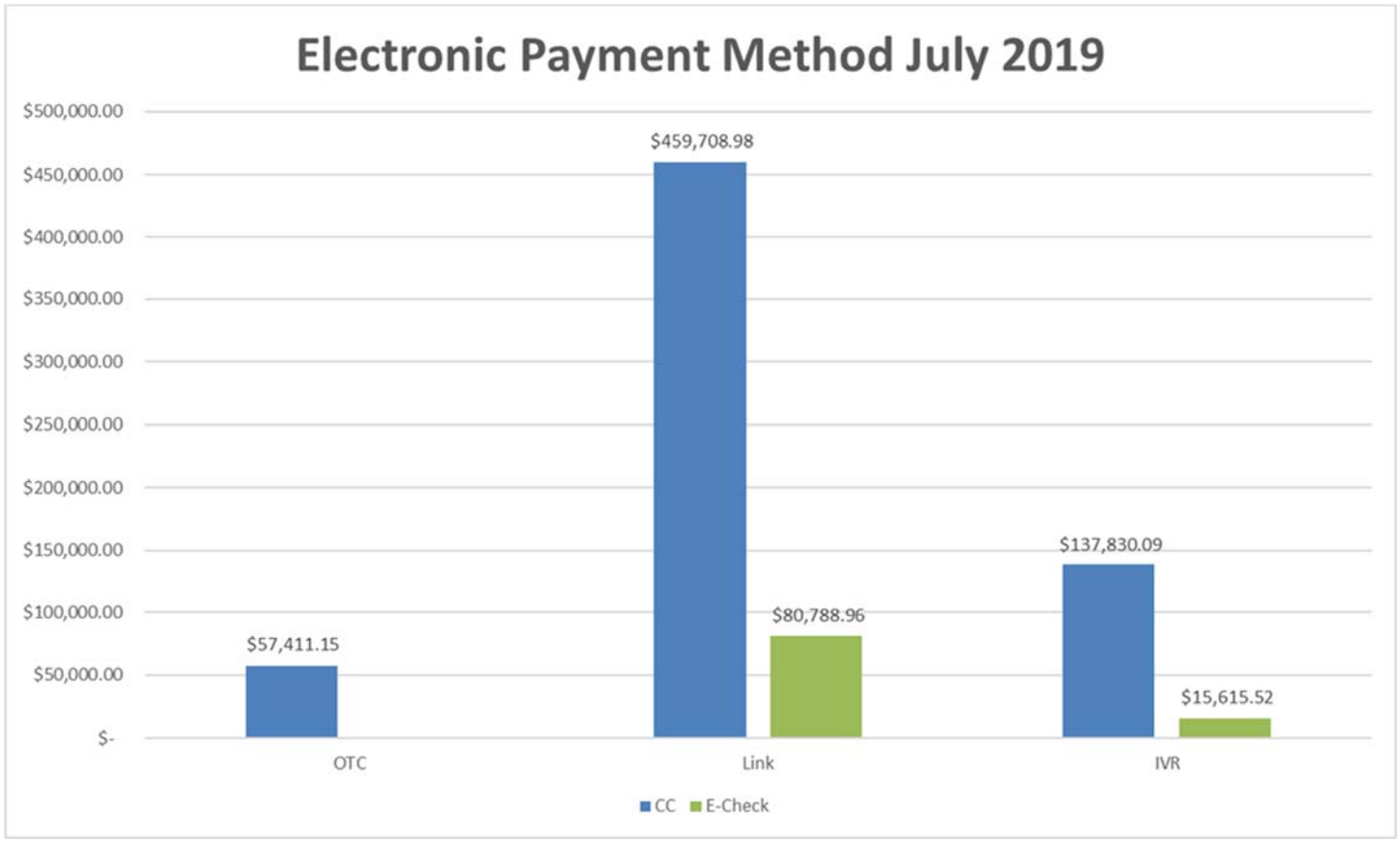
July 2019 Payments by Type

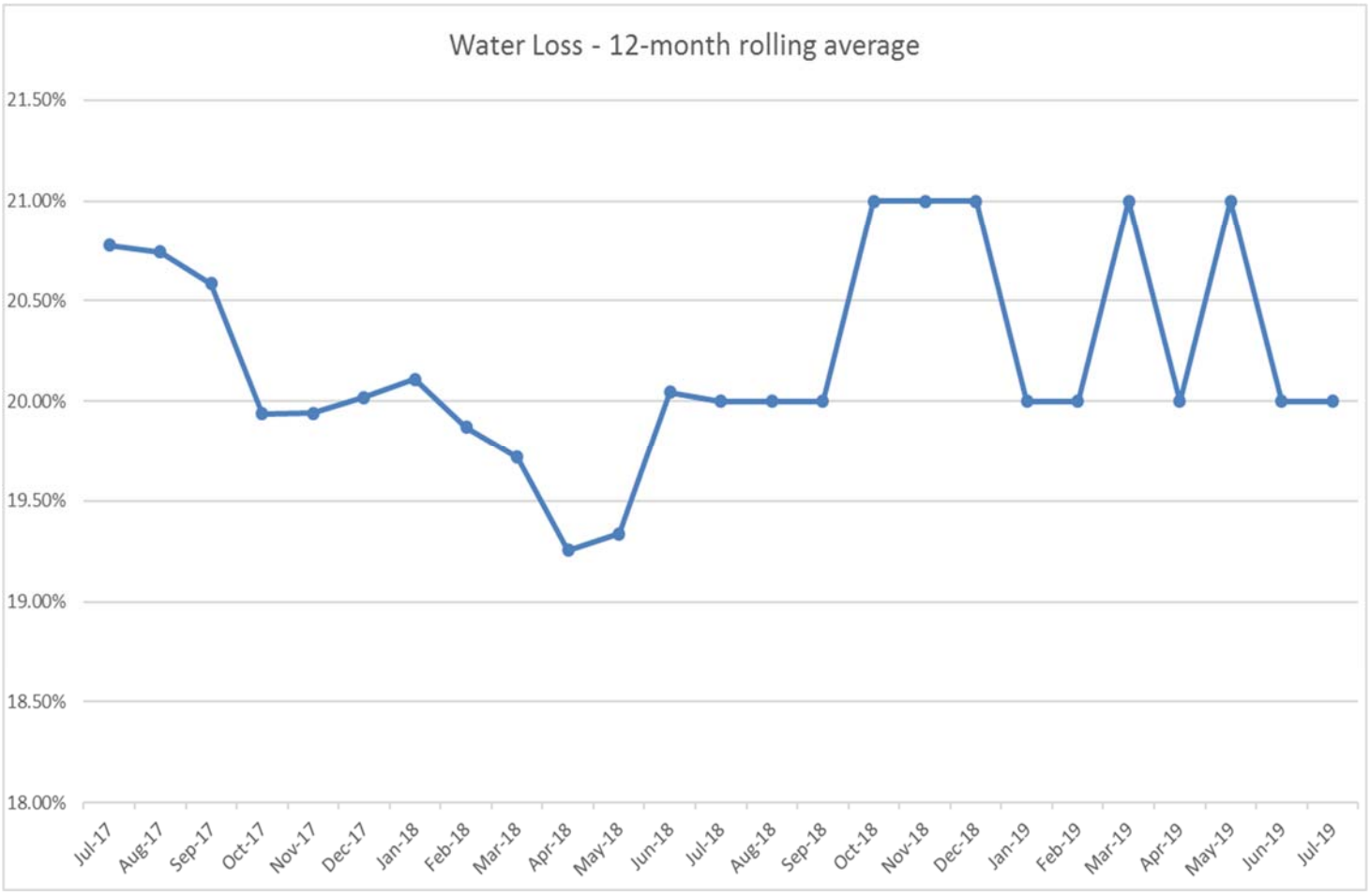


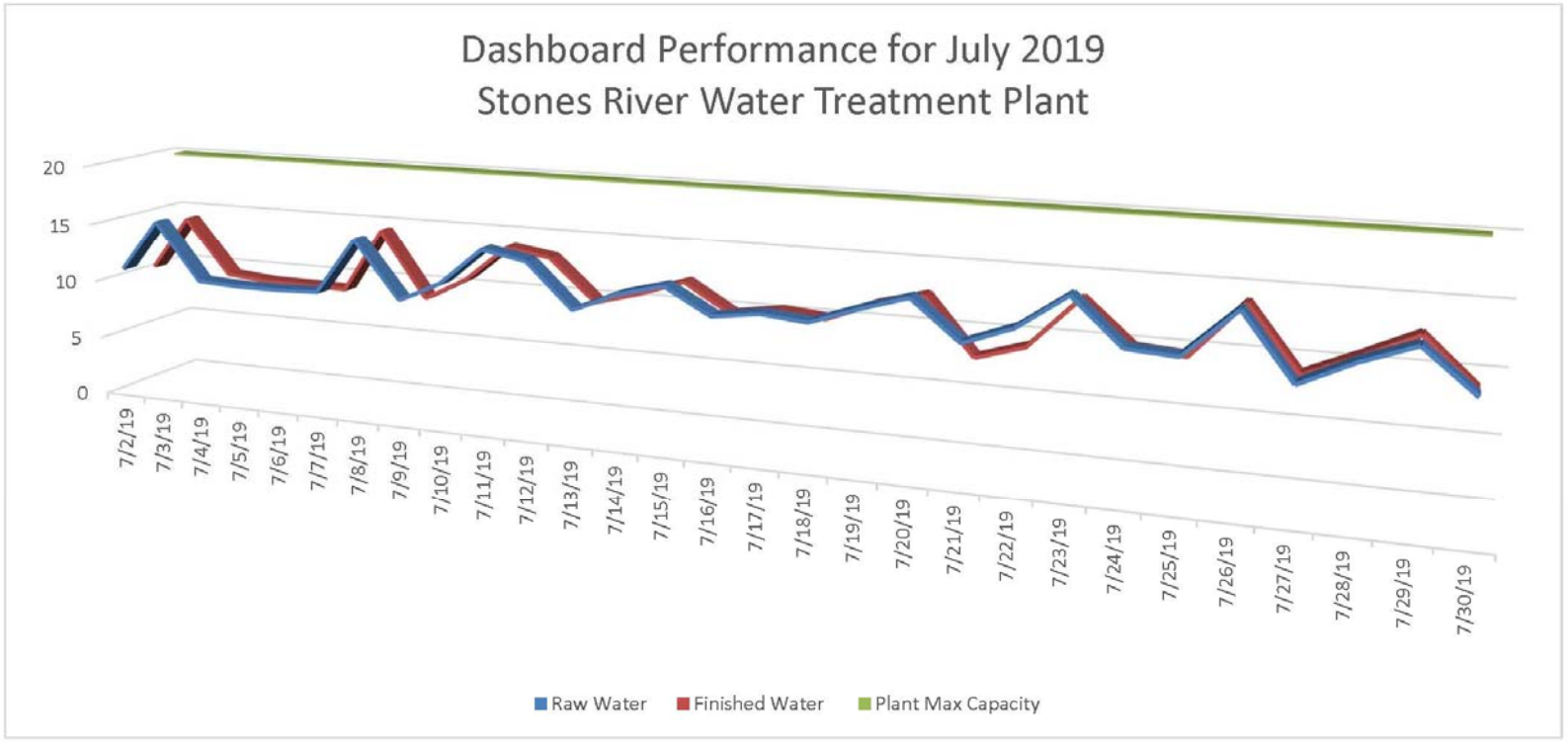

July Moves Processed = 1,714
Number of Moves Processed
1800
1600
1400
1200
1000
800
600
400
200
0
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
Jul-19
Month/Year
Ins
Outs
Total

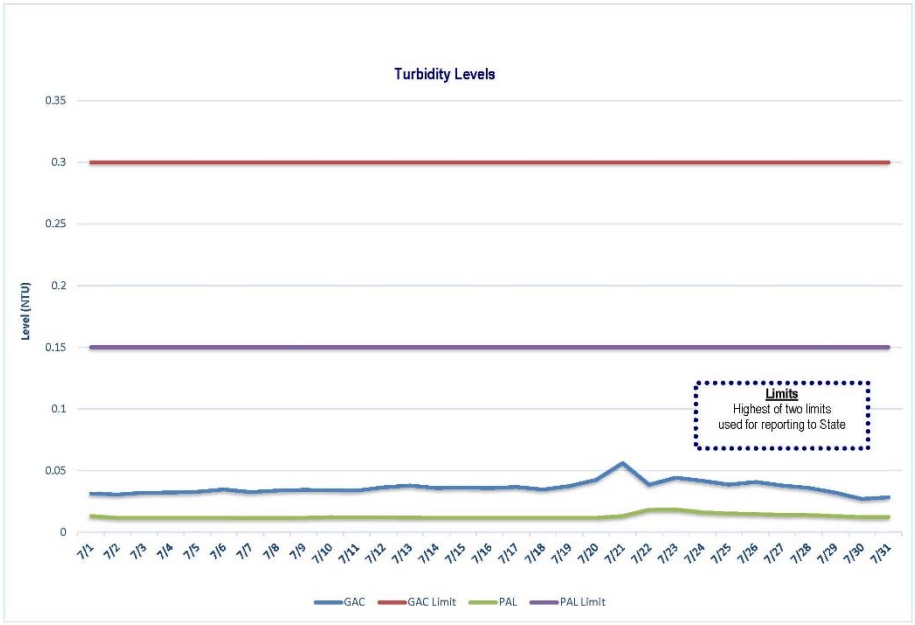

July Taps Sold = 152
160
140
120
100
80
60
40
20
0
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
Jul-19
Sold

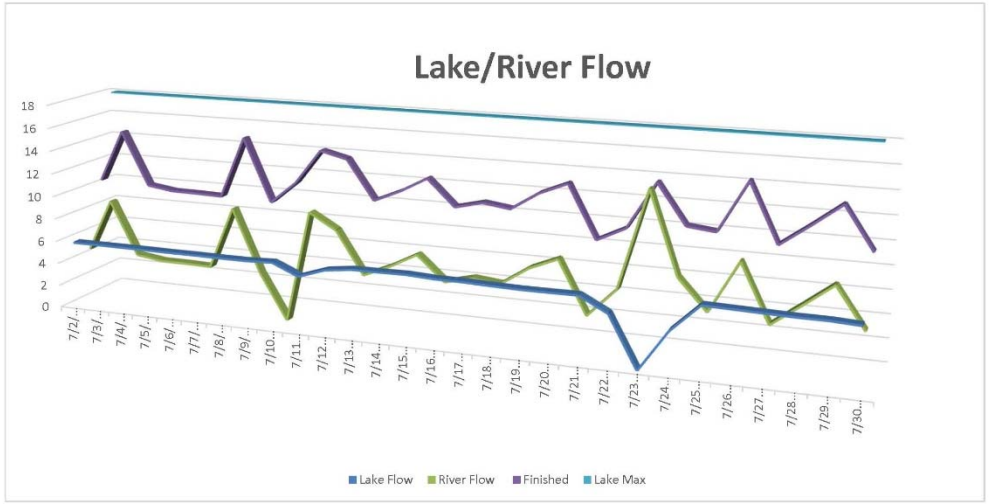

Credit Card & E-Check Payments - July $751k
Online/IVR CC
Online/IVR E-Check
TOTAL
Payment Amount
$800,000
$700,000
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$0
July
August
September
October
November
December
January
February
March
April
May
June
July


Electronic Payment Method July 2019
$500,000.00
$450,000.00
$400,000.00
$350,000.00
$300,000.00
$250,000.00
$200,000.00
$150,000.00
$100,000.00
$50,000.00
$-
$57,411.15
$459,708.98
$80,788.96
$137,830.09
$15,615.52
OTC
Link
IVR
CC
E-Check


Water Loss - 12-month rolling average
21.50%
21.00%
20.50%
20.00%
19.50%
19.00%
18.50%
18.00%
Jul-17
Aug-17
Sep-17
Oct-17
Nov-17
Dec-17
Jan-18
Feb-18
Mar-18
Apr-18
May-18
Jun-18
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
Jul-19





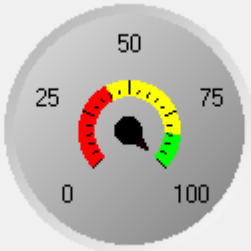
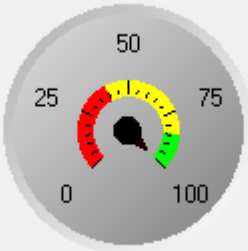


Total Finished Water Volume: 362.54 MG
Total Billed Water Volume: 273.66 MG
Water Loss: 25%

MURFREESBORO WATER RESOURCE RECOVERY FACILITY

DASHBOARD REPORT

July, 2019

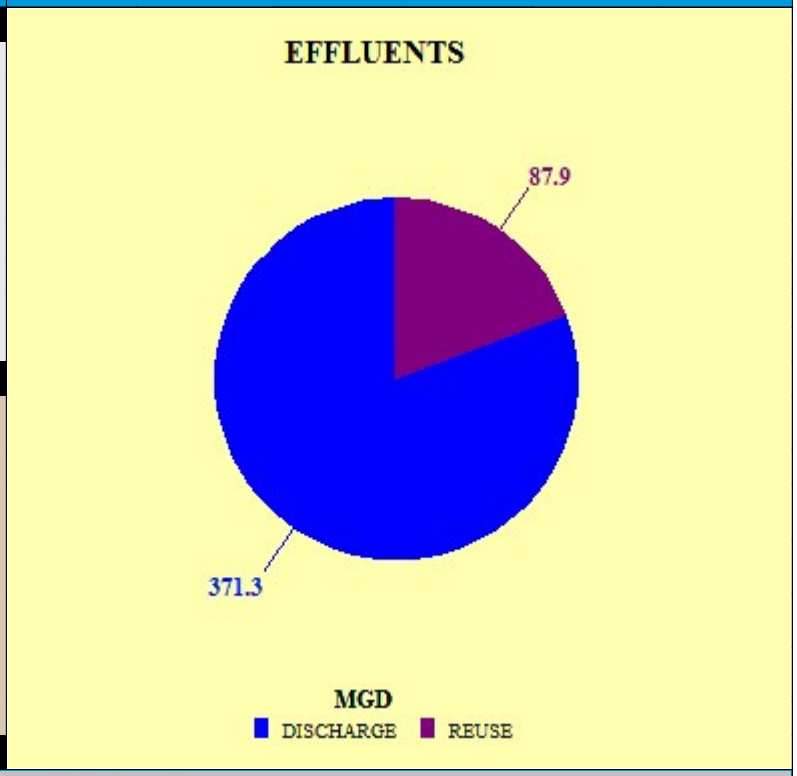
BOD PERCENT REMOVAL	AMMONIA PERCENT REMOVAL
	
99.4	99.4

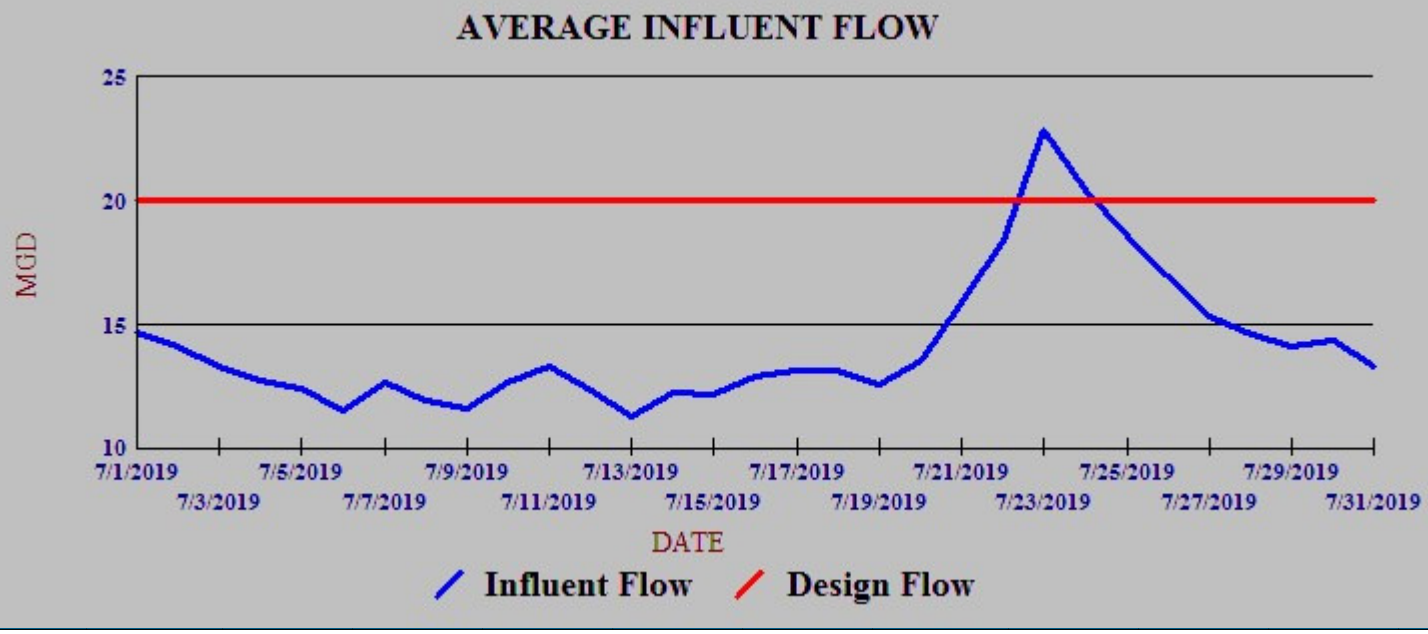
438.906

MILLION GALLONS TREATED

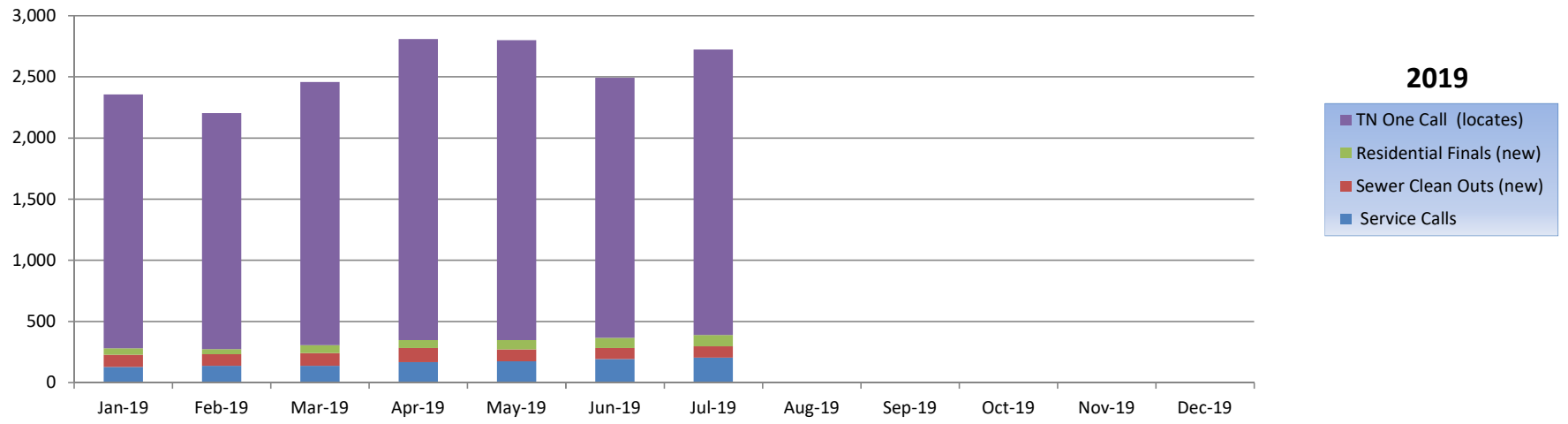
2,110.51

TONS BIOSOLIDS REMOVED



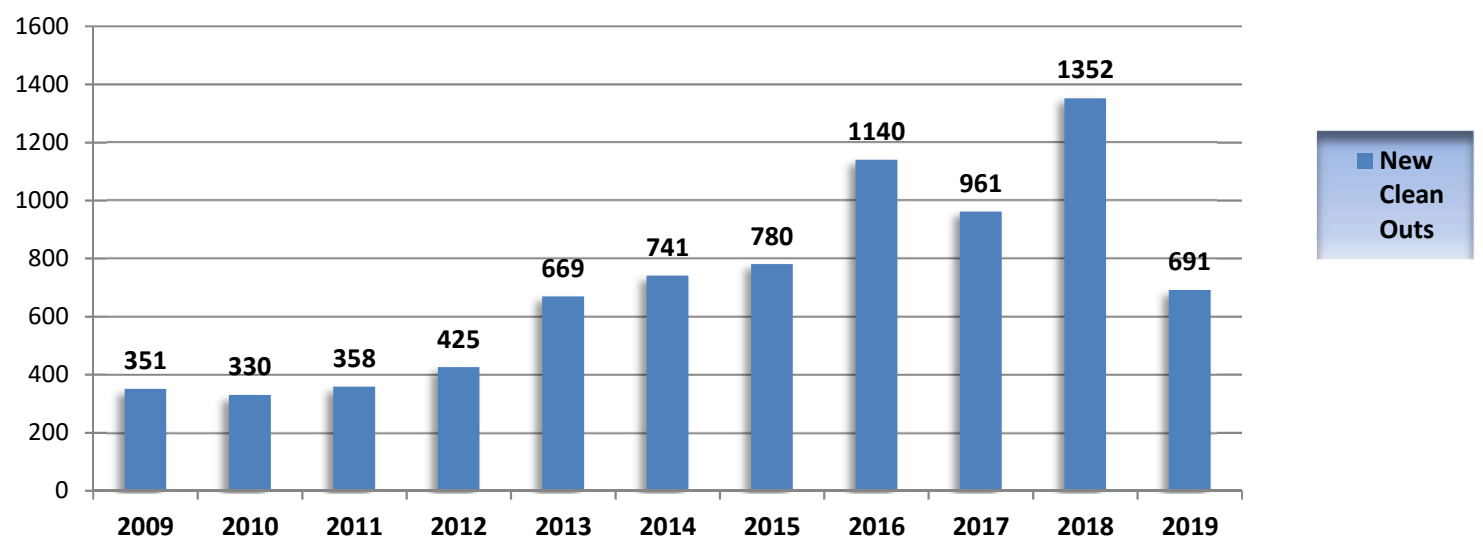


OPERATIONS & MAINTENANCE MONTHLY TOTALS



	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Total
Service Calls	129	138	139	168	176	193	205						**1,148**
Sewer Clean Outs (new)	100	95	104	115	97	91	93						**695**
Residential Finals (new)	52	41	65	65	76	84	93						**476**
TN One Call (locates)	2,076	1,931	2,150	2,463	2,452	2,125	2,334						**15,531**
TOTAL	**2,357**	**2,205**	**2,458**	**2,811**	**2,801**	**2,493**	**2,725**						**17,850**

NEW SEWER CLEAN OUTS



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
New Clean Outs	351	330	358	425	669	741	780	1140	961	1352	691

** For the calendar year Jan-Dec*

MWRD - OPERATIONS & MAINTENANCE

ASPHALT QUOTES

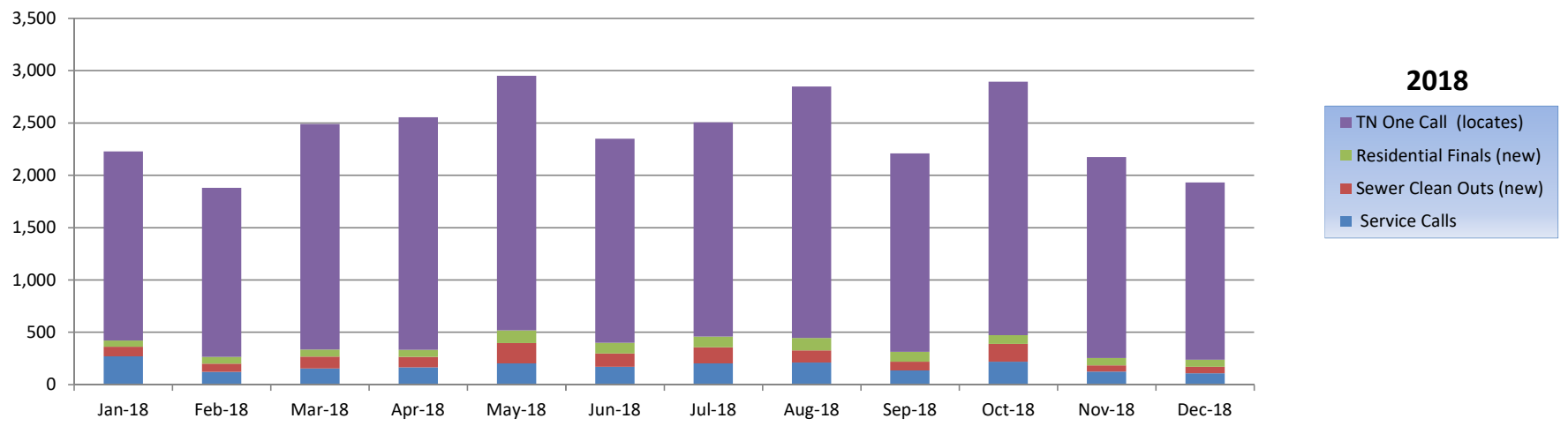
	Blue Water		Hawkins		Vulcan		Notes
	Binder	*Topping*	*Binder*	*Topping*	*Binder*	*Topping*	
Jul	*$49.00*	*$61.00*	$48.50	$60.50	$58.00	$67.50	
Aug	*$49.00*	*$61.00*	$48.50	$60.50	$58.00	$67.50	
Sep							
Oct							
Nov							
Dec							
Jan							
Feb							
Mar							
Apr							
May							
Jun							

MWRD OPERATIONS & MAINTENANCE

ASPHALT PURCHASES

Date	Approval	Vendor	Type	Rate	Qty	Total	FY Total
7/23	DH	Hawkins	BM	$48.50	23.97	$1,162.55	$1,162.55
7/23	DH	Hawkins	411E	$60.50	8.00	$484.00	$1,646.55
7/23	DH	Hawkins	411E	$60.50	54.06	$3,270.63	$4,917.18
7/26	DH	Hawkins	BM	$48.50	71.84	3,484.24	$8,401.42
7/29	DH	Hawkins	BM	$48.50	90.02	4,365.97	$12,767.39
7/30	DH	Hawkins	BM	$48.50	79.41	3,851.39	$16,618.77
7/30	DH	Hawkins	BM	$48.50	72.00	3,492.00	$20,110.77
7/31	DH	Hawkins	BM	$48.50	85.00	$4,122.50	$24,233.27

OPERATIONS & MAINTENANCE MONTHLY TOTALS



	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Total
Service Calls	273	124	155	167	205	171	206	213	137	221	127	109	**2,108**
Sewer Clean Outs (new)	91	78	115	99	195	128	153	117	84	169	59	64	**1,352**
Residential Finals (new)	60	65	66	69	119	102	103	117	93	84	71	68	**1,017**
TN One Call (locates)	1,805	1,614	2,155	2,222	2,434	1,949	2,046	2,404	1,896	2,421	1,918	1,692	**24,556**
TOTAL	**2,229**	**1,881**	**2,491**	**2,557**	**2,953**	**2,350**	**2,508**	**2,851**	**2,210**	**2,895**	**2,175**	**1,933**	**29,033**

MWRD - OPERATIONS & MAINTENANCE
DASHBOARD REPORT - FY'20

DISTRIBUTION SYSTEMS													
	JUL	***AUG***	***SEP***	***OCT***	***NOV***	***DEC***	***JAN***	***FEB***	***MAR***	***APR***	***MAY***	***JUN***	***TOTAL***
WATER PIPE (FT)													
1" Copper	0												**0**
2" Copper	0												**0**
1" PEX	1,470												**1,470**
2" PEX	0												**0**
SERVICES													
Fire Hydrants *(New)*	0												**0**
Fire Hydrants (*Blow off*)	0												**0**
Leaks Repaired	6												**6**
Taps *(New)*	1												**1**
Stubs *(New)*	47												**47**
Tap *(Replacements)*	0												**0**
Meter Connections	18												**18**
AMI													
Leaks Detected	11												**11**
Leaks (being monitored)	3												**3**
Leaks (awaiting repair)	3												**3**
Small Leaks (AMI/Serv Trucks-repaired)	5												**5**
Large Leaks (O&M Repair)	0												**0**
Large Meters Tested	0												**0**
Small Meters Tested	0												**0**
Mlog Changed	18												**18**
Meters Pulled	0												**0**
Meters Inspected	1,572												**1,572**

MWRD - OPERATIONS & MAINTENANCE
DASHBOARD REPORT - FY'20

COLLECTION SYSTEMS													
	JUL	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*TOTAL*
SEWER													
TV Lines	42,997												**42,997**
TV Lines *(Warranty)*	0.00												**0.00**
TV Laterals	1,122.00												**1,122.00**
Line Cleaning	120,474.10												**120,474.10**
SEWER REHAB													
Maintenance Projects	0												**0**
Lateral Replacement Pipe *(ft)*	42												**42**
Restoration	4												**4**
PRIVATE LATERAL													
Laterals Replaced	0												**0**
Laterals Repaired	0												**0**
4" SDR-35 *(ft)*	0												**0**
6" SDR-35 *(ft)*	0												**0**
STORMWATER													
Line Cleaning	0.00												**0.00**
SERVICES													
Sewer Cleanouts *(New)*	89												**89**
Sewer Cleanouts *(GIS Located)*	0												**0**

COLLECTION & DISTRIBUTION SYSTEMS													
	JUL	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*TOTAL*
SERVICES													
Service Calls	205												**205**
TN One Call Locates	2,334												**2,334**
Residential Insp	93												**93**
Residential Final Inspections	93												**93**
Commercial Final Inspections	7												**7**
Total	**2,732**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2,732**

MWRD - OPERATIONS & MAINTENANCE
DASHBOARD REPORT - FY'20

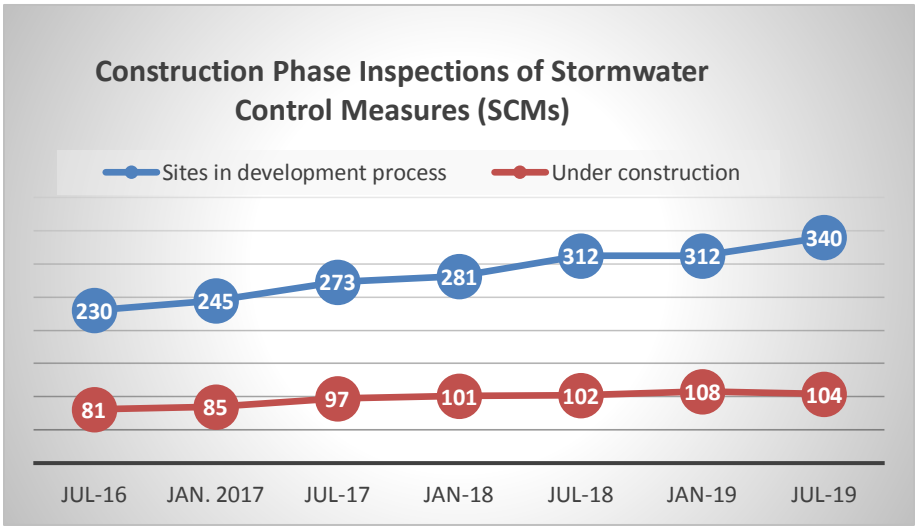
NEW CONSTRUCTION													
	JUL	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*TOTAL*
WATER PIPE (FT)													
6" C-900	0												**0**
8" C-900	0												**0**
6" Ductile Iron	0												**0**
8" Ductile Iron	0												**0**
1" Copper	0												**0**
2" Copper	0												**0**
1" PEX	393												**393**
2" PEX	52												**52**
Total	**445**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**445**
SEWER PIPE (FT)													
6" SDR-35 (PVC)	0												**0**
8" SDR-35 (PVC)	0												**0**
6" Ductile Iron	0												**0**
8" Ductile Iron	0												**0**
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
MAINTENANCE													
Tap *(Replacements)*	12												12
Stone	853												853

MWRD - OPERATIONS & MAINTENANCE
NON-BILLED FLUSHING REPORT - FY '20

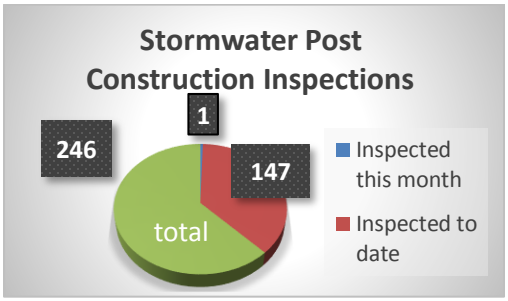
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
O&M DEPT.													
Meters (Events)	0												**0**
Fire Hydrants	48,626												**48,626**
Jet\Wash Trucks	0												**0**
Sweepers & Saw	500												**500**
Stub & Meter Connection	2,200												**2,200**
New Construction	22,739												**22,739**
Main Line Leaks	68,254												**68,254**
Subtotal O&M	**142,319**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**142,319**
ENGINEERING DEPT.	328,369												**328,369**
FIRE DEPT.	84,800												**84,800**
STREET DEPT.	34,900												**34,900**
Subtotal Other Depts	**448,069**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**448,069**
Total	**590,388**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**590,388**

Displayed in gallons

Stormwater Dashboard – July 2019



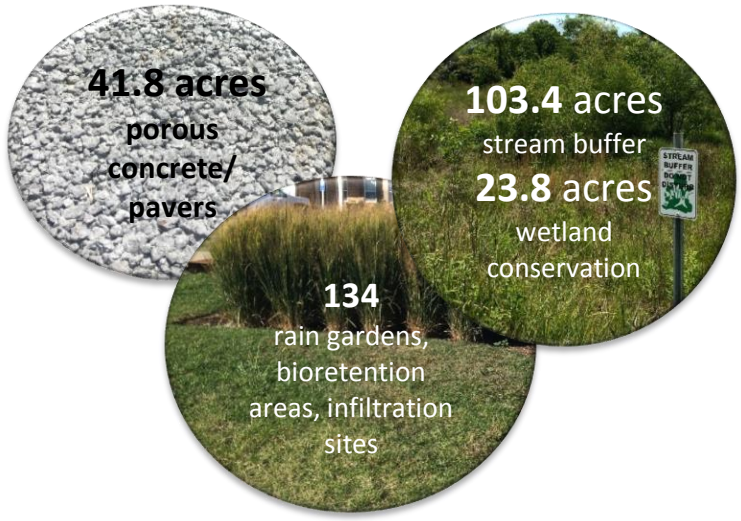
Inspection Program



Education and Outreach

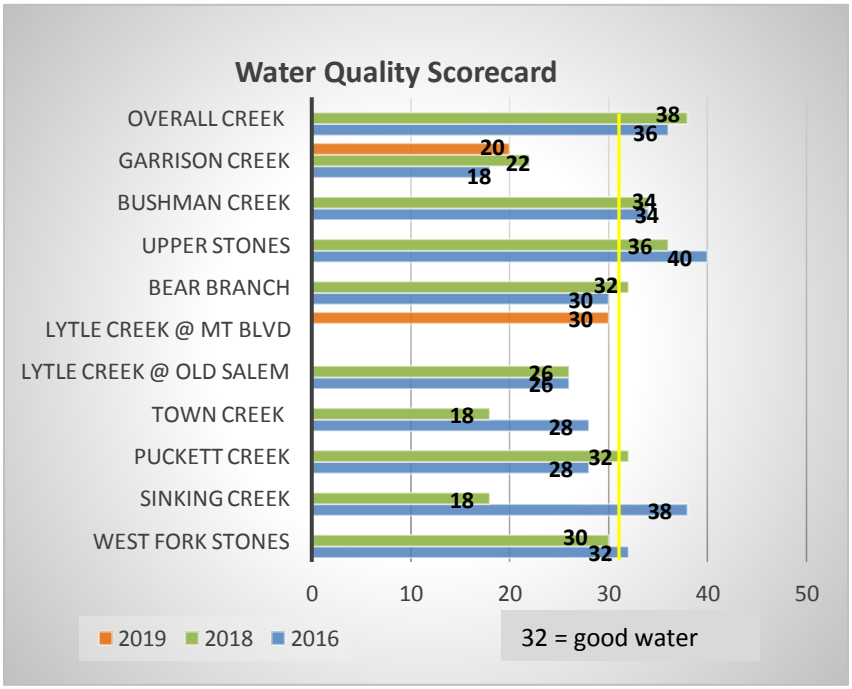
September 20th: 4th Annual Stones River Waterfest elementary student educational event

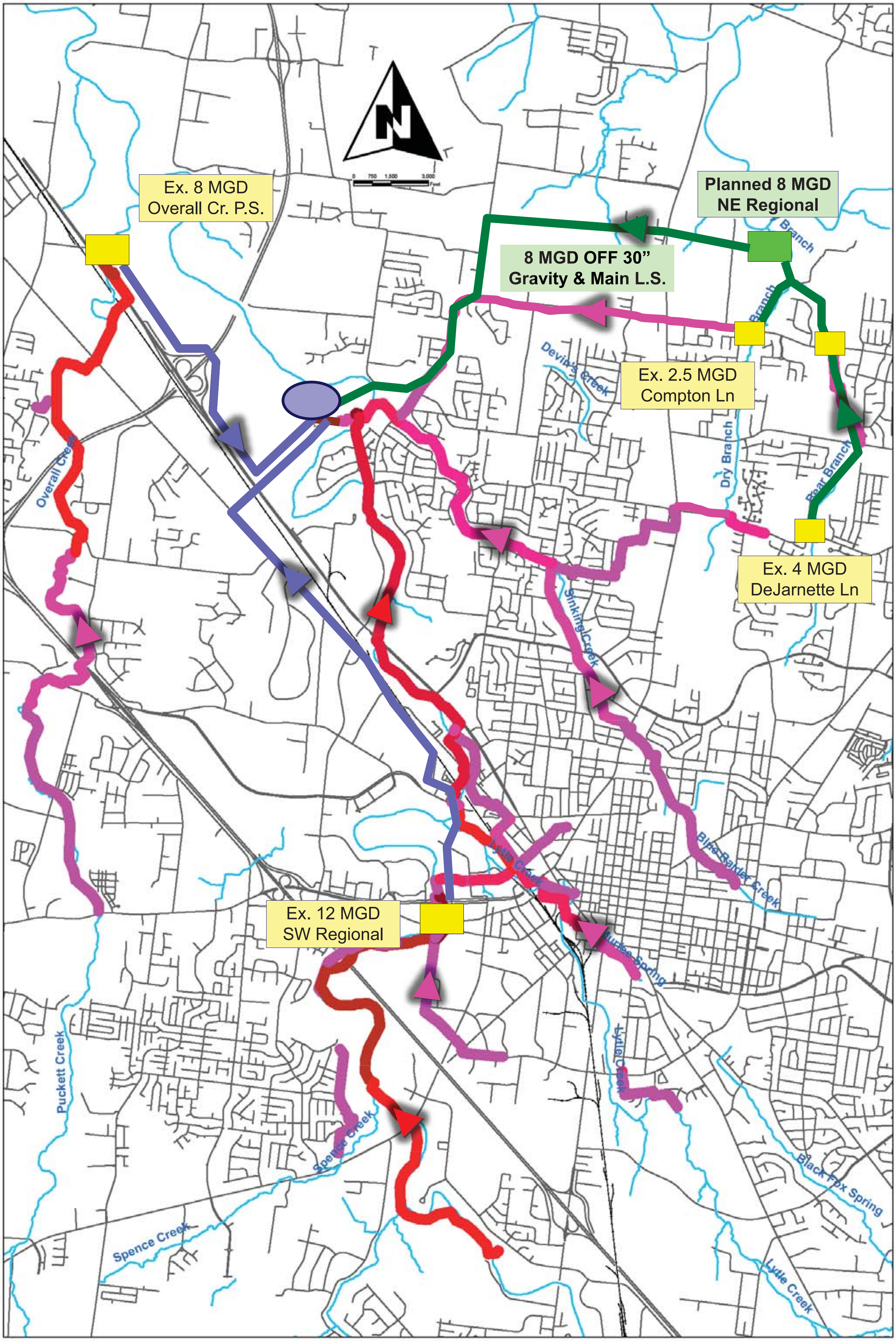
LID/ Green Infrastructure



Stormwater Infrastructure

	July	YTD	Total
Junction Boxes	86	379	16,125
Headwalls	19	150	6,762
Ponds	5	29	499
Gravity Mains	10,591 ft	53,456 ft	692.8 miles
Weirs	4	21	291
WQ Units	1	6	111
Underground Storage	0	0	30




Ex. 8 MGD
Overall Cr. P.S.
Planned 8 MGD
NE Regional
8 MGD OFF 30”
Gravity & Main L.S.
Ex. 2.5 MGD
Compton Ln
Ex. 4 MGD
DeJarnette Ln
Ex. 12 MGD
SW Regional
Overall Creek
Devin's Creek
Dry Branch
Bear Branch
Sinking Creek
Lytle Creek
Puckett Creek
Spence Creek
Black Fox Spring